Vol. 1022 Number 2

OFFICIAL GAZETTE

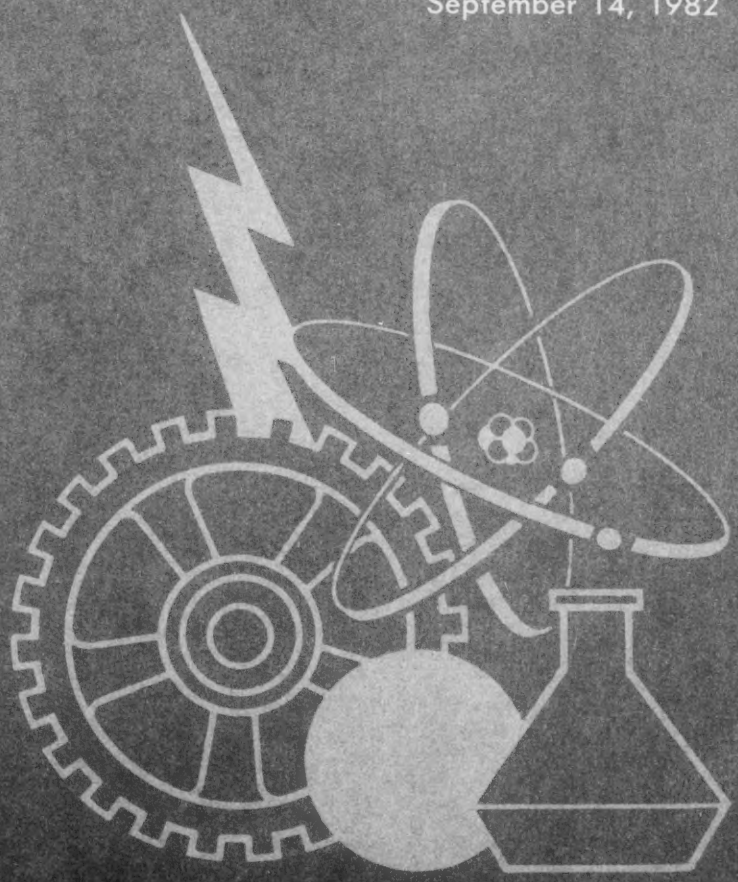
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

September 14, 1982



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 14, 1982 Volume 1022 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,645,835, Re. S.N. 393,084, Filed June 28, 1982, Cl. 428/195, MOISTURE-VAPOR-PREMEABLE PRESSURE-SENSITIVE ADHESIVE MATERIALS, Martin E. Hodgson, Owner of Record: *T.J. Smith & Nephew Ltd., Yorkshire, England,* Attorney or Agent: Albert L. Jacobs, Jr., Ex. Gp.: 164,

4,136,160, Re. S.N. 393,347, Filed June 29, 1982, Cl. 424/1, SPECIFIC ASSAY FOR ACTIVE DEMYELINIZATION, Steven R. Cohen, Owner of Record: *Inventor,* Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 223

4,248,802, Re. S.N. 393,439, Filed June 29, 1982, Cl. 260/604.86, CATALYTIC HYDROFORMYLATION OF OLEFINS, Emile Kuntz, Owner of Record: *Rhone-Poulenc Industries, Paris, France,* Attorney or Agent: William L. Mathis, et al., Ex. Gp.: 126

4,293,948, Re. S.N. 394,099, Filed July 1, 1982, Cl. 370/90, DATA TRANSMISSION SYSTEM, Olof Soderblom, Owner of Record: *Willemijn Houdstermaatschappij B. V., Rotterdam, the Netherlands,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 234

4,326,319, Re. S.N. 382,170, Filed May 26, 1982, Cl. 024/205.11R, SLIDE FASTENER WITH IMPROVED END CONNECTIONS, Martin F. Friedberg, Owner of Record: *Inventor,* Attorney or Agent: Richard A. Bachand, Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,597,549, Reexam. No. 90/000,242, Requested: Aug. 11, 1982, Cl. 370/88, HIGH SPEED DATA COMMUNICATION SYSTEM, Wayne D. Farmer, et al., Owner of Record: *Bell Telephone Laboratories, Inc. Murray Hill, Berkeley Height, N.J.,* Attorney or Agent: W. L. Keefauver, Ex. Gp.: 234, Requester: Willemijn Houdstermaatschappij B.V., Rotterdam, the Netherlands

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Errata

In the Official Gazette, Vol. 1021, No. 2, Aug. 10, 1982, an incorrect patent number was listed on page 568 stating, "Patent Not Issued For This Number." The correct patent number is 4,343,748.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-199,781. CHEMICAL MODIFICATIONS OF PROTEINS WHICH INDUCE NEW RECEPTOR SPECIFICITIES AND THEREFORE ELICIT NEW EFFECTS IN CELLS. National Institutes of Health.

SN 6-341,572. RICIN AND MODECCIN REAGENTS EFFECTIVE AS TUMOR SUPPRESSIVE CYTOTOXIC REAGENTS. National Institutes of Health.

SN 6-350,223. MONOCLONAL ANTIBODY-RICIN OR RICIN A CHAIN HYBRIDS. National Institutes of Health.

SN 6-350,222. INACTIVATING PROTEIN SYNTHESIS BY INCUBATING ANTI-THY 1.1-RICIN A CHAIN HYBRIDS WITH TARGET PROTEIN CELLS. National Institutes of Health.

SN 6-385,674. FLUORINATION BY INORGANIC FLUORIDES IN GLOW DISCHARGE. Department of Agriculture.

SN 6-168,816. (4,340,253) PREFLUSH-LIXIVIANT PROCESS FOR SOLUTION MINING OF URANIUM ORE BEDS. Department of the Interior.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 14, 1982

D. 263,701	4,296,117	4,325,656	4,333,944
3,653,745	4,297,722	4,325,743	4,334,255
4,153,201	4,300,835	4,325,990	4,334,316
4,180,640	4,301,443	4,326,209	4,334,398
4,181,713	4,304,739	4,326,241	4,334,995
4,201,146	4,306,278	4,326,509	4,335,090
4,202,688	4,307,073	4,326,616	4,335,301
4,205,340	4,308,338	4,326,840	4,335,530
4,211,795	4,309,933	4,327,020	4,335,673
4,215,720	4,311,171	4,327,100	4,336,068
4,226,629	4,311,609	4,327,578	4,336,164
4,235,501	4,311,834	4,327,947	4,336,273
4,242,456	4,312,098	4,328,165	4,336,442
4,243,592	4,312,387	4,328,168	4,336,540
4,252,542	4,312,810	4,328,361	4,336,659
4,259,699	4,313,410	4,328,656	4,336,744
4,263,368	4,313,580	4,328,902	4,336,841
4,264,264	4,314,906	4,329,242	4,337,337
4,265,792	4,316,330	4,329,285	4,337,412
4,268,651	4,318,201	4,329,442	4,337,420
4,268,781	4,318,953	4,329,478	4,337,421
4,274,560	4,319,270	4,329,660	4,337,956
4,275,094	4,319,443	4,330,264	4,338,142
4,276,202	4,320,038	4,330,291	4,338,336
4,276,353	4,321,525	4,330,621	4,338,414
4,279,000	4,321,530	4,330,641	4,338,415
4,279,259	4,321,647	4,330,667	4,338,416
4,279,951	4,321,666	4,330,761	4,338,561
4,280,380	4,321,812	4,330,770	4,338,662
4,280,903	4,321,864	4,331,388	4,338,734
4,280,917	4,322,068	4,331,546	4,338,962
4,284,741	4,322,914	4,331,941	4,339,065
4,284,997	4,323,052	4,331,984	4,339,089
4,285,065	4,323,607	4,332,045	4,339,469
4,288,780	4,323,827	4,332,095	4,339,475
4,288,786	4,324,542	4,332,141	4,339,726
4,289,954	4,324,668	4,332,693	4,339,877
4,292,333	4,324,985	4,332,798	4,340,430
4,292,585	4,325,086	4,332,800	4,340,612
4,293,634	4,325,107	4,332,892	4,340,760
4,294,313	4,325,120	4,333,442	
4,294,624	4,325,327	4,333,757	

Disclaimers

3,286,087.—*Edward E. Sheldon,* New York, N.Y. DEVICE FOR ILLUMINATION. Patent dated Nov. 15, 1966. Disclaimer filed Apr. 30, 1979, by the inventor.

The term of this patent subsequent to Oct 18, 1983 has been disclaimed.

3,524,255.—*Peter F. Kurer,* Manchester, Lancashire, England. EMETHOD OF ATTACHING A TOOTH CROWN TO A TOOTH ROOT. Patent dated Aug. 18, 1970. Disclaimer filed Aug. 14, 1978, by the inventor.

Hereby enters this disclaimer to claims 2 and 3 of said patent.

3,783,083.—*William A. Jenkins,* Englewood, Oh. COMPOSITE WEB OF PRESSURE SENSITIVE LABELS. Patent dated Dec. 25, 1973. Disclaimer filed Aug. 6, 1979, by the assignee, *Monarch Marking Systems, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 5, 6, 7, 11, 32, 33, 34 and 35 of said patent.

3,821,959.—*Otto K. Schmidt,* So. Windsor, Conn. RECONSTITUTED TOBACCO COMPOSITION. Patent dated July 2, 1974. Disclaimer filed Dec. 29, 1980, by the assignee, *AMF Incorporated.*

Hereby enters this disclaimer to claims 1 through 4, of said patent.

3,965,538.—*Jack E. Caveney,* Chicago; and *Roy A. Moody,* Flossmoor, Ill. INTEGRAL CABLE TIE. Patent dated June 29, 1976. Disclaimer filed Dec. 23, 1981, by the assignee, *Panduit Corp.*

The term of this patent subsequent of Mar. 25, 1992 has been disclaimed.

4,011,929.—*Edward M. Jeram,* Burnt Hills, and *Richard A. Striker,* Troy, N.Y. DAMPENING DEVICE USING A SILICONE RUBBER. Patent dated Mar. 15, 1977. Diclaimer filed July 22, 1982, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to the entire term of said patent.

4,255,172.—*Michael L. Smith,* Atlanta, Ga. JET IMPACTION PRESEPARATOR. Patent dated Mar. 10, 1981. Disclaimer filed Jan. 25, 1982, by the assignee, *Andersen Samplers, Inc.*

Hereby enters this disclaimer to all claims of said patent.

Dedications

3,801,466.—*Jerry W. Denney,* Carmel Ind. URIC ACID ASSAY AND REAGENTS THEREFOR. Patent dated Apr. 2, 1974. Dedication filed Feb. 25, 1982, by the assignee, *American Monitor Corp.*

Hereby dedicates to the Public the entire term of said patent.

4,154,020.—*Uriel Paz; Moshe Levy;* and *Zwy Levy,* Havazelet Hasharon, Israel. PROCESS FOR THE PROPAGATION OF ROSE PLANTS. Patent dated May 15, 1976. Dedication filed Dec. 28, 1981, by the assignee, *The Conard-Pyle Co.*

Hereby dedicates to the People of the United States of America the remaining term of said patent.

4,201,045.—*Elo N. Vani,* Cherry Hill, N.J. and *Roy W. Kiscaden,* Morton, Pa. FUEL LIMITER FOR COMBUSTION TURBINES. Patent dated May 6, 1980. Dedication filed Oct. 28, 1981, by the assignee, *Westinghouse Electric Corp.*

Hereby dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

ENACTMENT OF H.R.6260

STATEMENT BY THE PRESIDENT

August 28, 1982

The following is the text of President Reagan's Statement at the signing of H.R.6260 into law:

"I am pleased to sign into law H.R.6260 which authorizes appropriations for the Patent and Trademark Office for fiscal years 1983-1985. Throughout our Nation's history, the patent system has played a critically important role in stimulating technological advances. This legislation will make it possible for the Patent and Trademark Office to improve its operations and thus revitalize its traditional role of encouraging technical innovation.

"This measure reflects the policy of this Administration that those who benefit most directly from services should pay their fair share for them. For years the Patent and Trademark Office has not had the resources to carry out its mission properly or to modernize its operations. Now that this legislation is in place, most users will pay the actual cost of processing patents and trademarks. This means that even though the expenditure of tax revenue in FY 1983 to support the Patent and Trademark Office will be $21 million lower than in FY 1982, the total resources available to the Office through increased user fees will permit it to become a first-class service organization.

"We neither want nor expect the increased user fees to discourage the ingenuity and creativity of individual inventors. Many of our most important inventions have come from individuals working alone. Accordingly, the bill provides that independent and small business inventors, as well as nonprofit corporations, will pay only fifty percent of the actual patent processing costs.

"A major deterrent to using the patent system, especially by small businesses and independent inventors, is the inordinately high cost of patent litigation. This bill authorizes voluntary arbitration of patent validity and infringement disputes. This will not only improve the patent system and encourage innovation, but will help relieve the burden on the Federal courts.

"Development of new technology is a vital ingredient in my Administration's plan for economic recovery. This measure is a significant step in this process. At the same time, it symbolizes our commitment to making the Federal Government more effective and efficient. It is an excellent example of how the Federal Government can provide better service at less cost to the taxpayers, and I commend the Congress for enacting this important measure."

1022 OG 15

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 24, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-18-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-13-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	4-09-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-07-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director .... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-27-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-24-82
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-27-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,192,536 to 3,197,783, inclusive

Plant Patents ..... Numbers 2,543 to 2,545 inclusive

REISSUES

SEPTEMBER 14, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,027

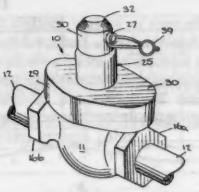
LOCKING HOOD ASSEMBLY FOR FLOW CONTROL DEVICE

Bernard A. Di Giovanni, 96 Davis Ave., Hauppage, N.Y. 11787

Original No. 4,024,740, dated May 24, 1977, Ser. No. 684,573, May 10, 1976. Application for reissue Sep. 25, 1978, Ser. No. 945,561

Int. Cl.³ G05G *5/00*; F16K *35/00*

U.S. Cl. 70—175 **23 Claims**



1. A flow control device having a fixed portion and an operating member which is movable with respect to said fixed portion; a locking hood assembly mounted on said flow control device for preventing said movement of its said operating member, said locking hood assembly comprising a main body having an interior configuration fitting on and substantially surrounding said operating member; and releasable means retaining said main body in its said fitting relation with respect to said operating member; said locking hood assembly further comprising a removable cover cap on said main body covering and thereby preventing access to said releasable retaining means, and removable lock means for locking said cover cap in said position on said main body.

Re. 31,028

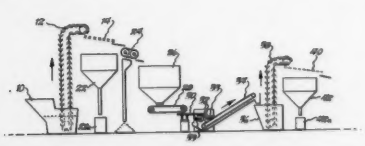
METHOD FOR PROCESSING DROSS

Paul J. Cromwell, Williamsville, N.Y., assignor to Cromwell Metals, Inc., Buffalo, N.Y.

Original No. 4,126,673, dated Nov. 21, 1978, Ser. No. 902,481, May 8, 1978. Continuation-in-part of Ser. No. 796,729, May 13, 1977, abandoned. Application for reissue Nov. 20, 1980, Ser. No. 208,722

Int. Cl.³ B02C *23/14*

U.S. Cl. 241—14 **43 Claims**



39. A method for reclaiming, in relatively high metallic concentrate form, aluminum substances entrained in dross, said method comprising the steps of:

conveying said dross to a pair of roller means having a predetermined spacing, said dross comprising particles of a predetermined size range,

compressing said dross to a limited degree without substantially crushing the same between said pair of roller means by passing said dross therebetween so as to substantially break the bonds between the metallic and non-metallic substances in said dross, and

separating said non-metallic substances from said metallic substances so that relatively concentrated metallic substances remain whereby metallic dust-like particles become disassociated from said metallic substances and are commingled with said non-metallic substances after separation of the latter from said metallic substances.

Re. 31,029

DIALYZER CARTRIDGE AND METHOD FOR ITS MANUFACTURE

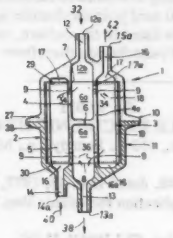
Wilfried Schael, Bad Homburg, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Original No. 4,141,836, dated Feb. 27, 1979, Ser. No. 724,935, Sep. 20, 1976. Application for reissue Dec. 1, 1980, Ser. No. 212,081

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1975, 2542438

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.2 **15 Claims**



14. A dialyzer comprising housing means (10, 11), a first set of ports including inflow port means (14) for blood in said housing means and outflow port means (15) for blood in said housing means, a second set of ports including dialysis liquid inflow port means (12) in said housing means and dialysis outflow port means (13) in said housing means, tubular core means (4) in said housing means to provide an annular space between said housing means and said core means (4), hollow filament means (3, 18) having open filament ends, sealing and bonding means (29, 30) operatively bonding the hollow filament means (3, 18) to one another adjacent said open ends, said hollow filament means occupying said annular space, first flow communication means in said housing means (16, 17) for providing flow communication into and out of said open filament ends and the respective one of said port sets arranged at each end of said hollow filament means, interstices extending between said hollow filament means substantially all along said hollow filament means between said bonding means (29, 30), second flow communication means (9) in said core means (4) for providing flow communication between said interstices and said second set of ports, said second flow communication means consisting of first and second passage openings (9) extending radially outwardly through said core means (4) and located only substantially directly adjacent to each of said bonding means (29, 30), and separation means (6) in said core means (4) for closing off said first passage openings (9) from said second passage openings (9) except through said interstices whereby a liquid flowing from said inflow port means to said outflow port means of said second set of ports is forced to flow through said interstices substantially along the entire effective length of said filament means between said first and second passage openings, for optimally using the available interface surface formed by said hollow filament means.

Re. 31,030

PROCESS FOR THE PRODUCTION OF NOVEL POLYSACCHARIDE

Kenichi Hisatsuka; Saburo Ishiyama; Akira Inoue; Osamu Tsumura, all of Sodegaura, and Mikio Sato, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Original No. 4,153,508, dated May 8, 1979, Ser. No. 839,900, Oct. 6, 1977. Division of Ser. No. 759,627, Jan. 17, 1977, Pat. No. 4,146,706. Application for reissue Sep. 4, 1980, Ser. No. 184,017

Claims priority, application Japan, Jan. 19, 1976, 51/4051; Apr. 5, 1976, 51/37224

Int. Cl.³ C12P *19/04*; C12R *1/38*

U.S. Cl. 435—101 **1 Claim**

1. A process of producing a polysaccharide having a gel forming property which is characterized by the following properties: (1) comprising (a) glucose, (b) mannose, (c) dihydrostreptose and (d) 3-O-(1′ carboxyethyl)-L-rhamnose, the molar ratio of said constituents being (a):(b):(c):(d)=10:10:1–3:3–8, and (2) containing an O-acetyl group in an amount of from 8 to 14 weight percent calculated as acetic acid;

which comprises cultivating [a] *the* microorganism [Arthrobacter carbazolum] *strain FERM 2574 (ATCC-31258) or a polysaccharide producing mutant thereof* in a medium containing assimilable carbon sources and nitrogen sources until said polysaccharide is formed and substantially accumulated in the culture, and recovering the accumulated polysaccharide therefrom

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Re. 31,031

IMPLANTABLE ELECTRONIC HEARING AID

Adam M. Kissiah, Jr., 155 E. Brandy La., Merritt Island, Fla. 32952

Original No. 4,063,048, dated Dec. 13, 1977, Ser. No. 778,193, Mar. 16, 1977. Application for reissue Dec. 11, 1979, Ser. No. 102,377

Int. Cl.³ H04R *25/00*

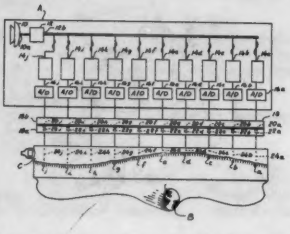
U.S. Cl. 179—107 R **8 Claims**

1. An electronic hearing aid device for use in aiding a person having a [non-functioning] *malfunctioning* inner ear mechanism comprising:

receiver means for receiving an external audio signal and converting said signal into an analog voltage signal;

amplifier means connected to said receiver means for receiving said analog voltage signal and amplifying said voltage signal;

a plurality of frequency filter networks each having an input connected to an output of said amplifier means for receiving said amplified voltage signal and filtering said analog signal into a number of separate frequency component signals corresponding to a predetermined frequency range of each respective filter network;



[analog-digital] *analog-pulse* converter circuit means connected to the output of each filter network for receiving each said frequency component signal and converting said signal into a [digital] *pulsed* component signal; and

a plurality of [elongated] electrode members each having one end connected to an output of one of said converter circuit means with the remote end thereof adapted for being implanted adjacent a portion of the auditory nerve system [of the inner ear] for transmitting said [digital] *pulsed* component signals for interpretation in the hearing portion of the brain.

PLANT PATENTS

GRANTED SEPTEMBER 14, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,886

SEEDLING ROSE NO. 78-2R

Lowell L. Hoy, Jr., Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Jan. 5, 1981, Ser. No. 222,492

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized, in particular, by its free, abundant and continuous production of flowers borne on long, strong stems and which have an improved vase life; its moderately abundant production of medium large leaves throughout the entire length of the stem; and by its vigorous and much branched growth habit.

4,887

LILY NAMED MERCI

Ted T. Kirsch, Myrtle Point, Oreg., assignor to Sun Valley Bulb Farms, Inc., Myrtle Point, Oreg.

Filed Dec. 12, 1980, Ser. No. 216,066

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental Hybrid lily plant, substantially as herein shown and described, characterized by its medium-large, upwardly-facing flowers borne on strong, stiff and close to vertically upstanding pedicels, and by its generally flat, moderately spotted and reddish-pink appearing petals on which the color fades laterally from a dark red central and longitudinally-extending stripe.

PATENTS

GRANTED SEP. 14, 1982

ERRATA

For CLASS	See PATENT NO.
114–345	4,348,779
336–125	4,348,824
464–162	4,348,874
464–170	4,348,875
374–124	4,348,898
525–054	4,349,467
524–302	4,349,468
524–765	4,349,469
549–297	4,349,481
549–518	4,349,482
378–083	4,349,736
378–049	4,349,738
378–099	4,349,739
378–025	4,349,740
290–040	4,349,744
360–015	4,349,757

PATENTS

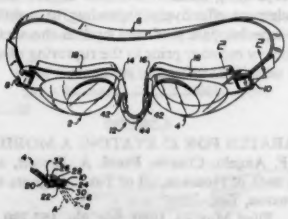
GRANTED SEPTEMBER 14, 1982

GENERAL AND MECHANICAL

4,348,774
WEIGHT LIFTER'S BELT
Thomas W. Woodson, Knoxville, Tenn., assignor to The Christian Leather Company, Inc., Knoxville, Tenn.
Filed Jul. 18, 1980, Ser. No. 170,171
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—338 **4 Claims**

1. In a weight lifting belt fabricated from leather having a relatively wide portion to cover the back and flanks of the wearer and having means to cinch the belt around the wearer, the improvement which comprises providing a liner which extends across the entire inner surface of the belt in the area of the back and flanks of the wearer, said liner being of a thickness less than the thickness of the leather belt, said liner being fabricated from a foamed flexible plastic having a Shore A Durometer hardness of between about 10 and 25 and the liner being attached to the inner surface of said belt by a flexible adhesive.

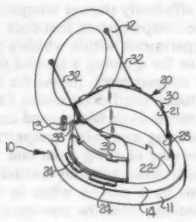
4,348,775
EYE PROTECTOR
Joseph Haslbeck, West Vancouver, Canada, assignor to Highland Mfg. Company, Ltd., Burnaby, Canada
Filed Dec. 4, 1980, Ser. No. 213,055
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—452 **12 Claims**

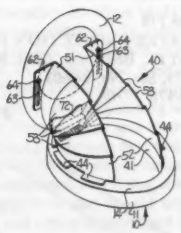


1. In an eye protector to be secured over at least one eye by a stretchable, imperforate, resilient head strap to attach the eye protector to the head of a wearer;

at least one inner slot and at least one outer slot formed at one edge of the protector through which slots the head strap is positioned and retained by frictional force, the improvement comprising the provision of a third slot extending outwardly from the outer slot to an outer edge of the protector, generally transverse to the outer slot, whereby the strap may be engaged in the outer slot by feeding an edge of the strap through the generally transverse third slot to engage in the outer slot.

4,348,776
COLLAPSIBLE SPLASH SHIELD FOR TOILET
Dale C. Sarjeant, 1425 Meadowood La., Charlotte, N.C. 28211
Filed Jul. 27, 1981, Ser. No. 287,055
Int. Cl.³ E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—300.3 **9 Claims**





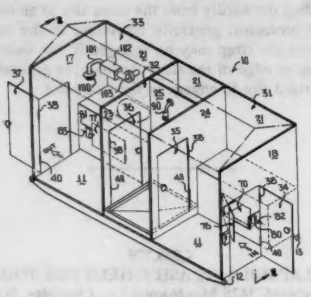
1. A collapsible splash guard for use with a toilet having a bowl and a seat hingedly connected to the bowl adjacent the rear of the bowl, said splash guard being adapted for movement between an extended operative position when the toilet seat is in the raised position and a collapsed storage position when the seat is in a lowered position, and said collapsible splash guard comprising a plurality of segments assembled in nested relationship and adapted to extend along opposite side portions of the toilet bowl, said segments being arranged in a collapsed storage position within the bowl of the toilet when the seat is in the lowered position, means for connecting one of said nested segments to the toilet seat so that said one segment is lifted upwardly from within the bowl when the toilet seat is moved to the raised position, means interconnecting the respective nested segments so that when the toilet seat is raised and said one segment is lifted upwardly, the other segments are moved with respect to one another from said collapsed nested relationship to an extended overlapping relationship positioned above the toilet bowl and forming an enclosure shieldingly surrounding the toilet bowl.

4,348,777

PORTABLE SHOWER

Guy E. Peterson, Rte. 3, Box 519, Irwin, Tenn. 37650

Filed Mar. 2, 1981, Ser. No. 239,475
Int. Cl.³ A47K 3/22
U.S. Cl. 4—596 29 Claims



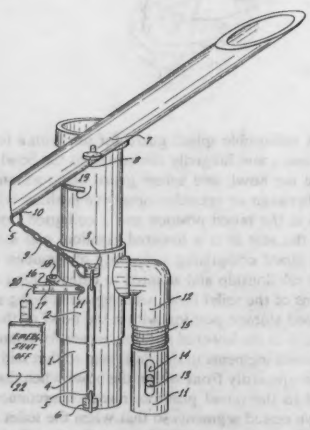
1. A shower module particularly adapted for use at construction sites, campgrounds, industrial plants, truck and auto service stations and the like in which persons can conveniently and efficiently shower comprising partition means for forming three compartments, first door means for entering a first of said compartments within which a person can disrobe, second door means for entering a second of said compartments from said first compartment, means for showering in said second compartment, third door means for entering a third of said compartments from said second compartment, fourth door means for exiting said third compartment, and conveyor means for conveying clothing from said first compartment to said third compartment whereby clothing placed upon said conveyor means by a person when in said first compartment can be reobtained from the conveyor means by the person when in said third compartment.

4,348,778

EMERGENCY TOILET WATER PROTECTION UNIT

Joseph P. Rau, 15351 Woodruff Pl., Bellflower, Calif. 90607

Filed Oct. 15, 1979, Ser. No. 84,603
Int. Cl.³ A47K 17/00
U.S. Cl. 4—661 6 Claims



1. In combination with a flush toilet having a toilet bowl and a water supply tank, said tank including a ball float and an outlet water control plunger located adjacent to an upwardly extending pipe mounted inside said supply tank, a device for preventing toilet water overflow, comprising:

means for stopping the flow of water into and out of said supply tank, said means including a tubular sleeve member installed over said pipe, said tubular member including thereon an outer sleeve member, a control arm pivotedly attached to said tubular member and positioned below and in generally faced opposed relation to said ball float, a plunger member mounted onto and extending out from said outer sleeve member and positioned above and in generally faced opposed relation to said water control plunger, and,

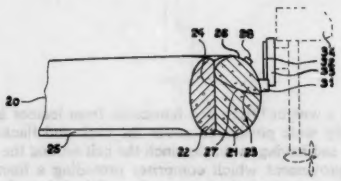
means for triggering said means for stopping the flow of water so that said control arm and said plunger member contact said ball float and said water control plunger, respectively, to stop the flow of water into and out of said supply tank.

4,348,779

INFLATABLE BOAT WITH ADDITIONAL INFLATABLE ELEMENTS COMPENSATING FOR LOSS IN BUOYANCY

Edmond Leber, Buhl, France, assignor to Sevylor, France

Continuation of Ser. No. 851,189, Nov. 14, 1977, abandoned.
This application Aug. 9, 1979, Ser. No. 65,105
Claims priority, application France, Nov. 15, 1976, 76 34836
Int. Cl.³ B63B 7/00; B63C 9/04
U.S. Cl. 114—345 5 Claims



1. An inflatable boat comprising, a hull comprising first and second inflatable elements disposed side-by-side and inflatable separately of sufficient buoyancy for supporting at least one of relatively heavy members secured to the hull, a plurality of additional separately inflatable elements in said hull disposed for buoyantly supporting at least one of said relatively heavy members and having a common wall and at least one of said additional inflatable elements being effectively expandable upon an adjacent one of the additional inflatable elements having said common wall rupturing, said at least one of said additional inflatable elements being disposed internally of one of said additional inflatable elements for effectively assisting in buoyantly supporting said at least one relatively heavy member upon expanding thereof, and said at least one additional inflatable element effectively expanding to maintain substantially the same buoyancy of said hull in the vicinity of said relatively heavy member prior to the rupturing of said adjacent one of the additional inflatable elements.

4,348,780

APPARATUS FOR ELEVATING A MOBILE RIG

Lawrence F. Angelo, Conroe; Frank A. Bryant, and John D. McLain, both of Houston, all of Tex., assignors to WellTech, Inc., Houston, Tex.

Filed May 23, 1980, Ser. No. 152,790
Int. Cl.³ E01D 1/00
U.S. Cl. 14—1 5 Claims

2. Apparatus for elevating a mobile rig positioned adjacent to a structure to an elevation above the ground level, which comprises:

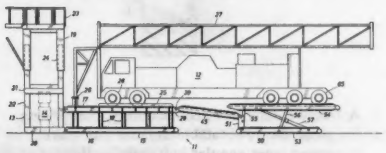
a portable first ramp adapted for supporting said rig and

positionable adjacent to said structure, said first ramp having a forward end and a rearward end with said rearward end being spaced more distant from said structure than said forward end, said first ramp being movable from a first position wherein said rearward end is proximate to said ground level to provide an inclined ramp to a second position wherein said forward and rearward ends are substantially at said elevation above said ground level;

means connected to said first ramp for moving said first ramp between said first and second positions;

a portable forward platform positionable between said structure and said forward end of said first ramp, said forward platform having forward and rearward ends, said forward end being adapted for attachment to said structure and said forward platform having a substantially level portion adapted for supporting said rig at said elevation above said ground level;

an inclined portable intermediate ramp positionable between said forward platform and said first ramp, said intermediate ramp having forward and rearward ends, said forward



end positionable proximate to said rearward end of said forward platform and said rearward end positionable proximate to said forward end of said first ramp when said first ramp is in said first position, wherein the slope of said intermediate ramp is substantially the same as the slope of said first ramp when said first ramp is in said first position;

said first ramp including a base having forward and rearward ends, a support for supporting said rig, forward legs pivotally connected between said base and said upper support; and rearward legs pivotally connected between said base and said upper support, wherein the lengths and positions of attachment of said forward and rearward legs are such that said upper support is pivotal between said first position and said second position;

said moving means including hydraulic cylinder means connected between said base and said upper support;

means for locking said upper support in said second position, including post means attached to said forward end of said base;

and means associated with said post means for pinning said forward legs to said post means.

4,348,781

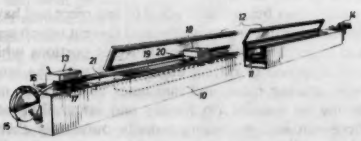
HOSE CLEANING PLANT

Hans V. Wahlström, Bergasstigen 3, 182 33 Danderyd; Rolf E. Nilsson, Uttervägen 9, 195 00 Märsta, both of Sweden, and Kjell A. Pihlgren, Upplands Väsby, Sweden, assignors to Hans V. Wahlström, Danderyd and Rolf E. Nilsson, Märsta, both of, Sweden

Filed Apr. 1, 1981, Ser. No. 249,839

Int. Cl.³ A46B *13/02*; D06G *1/00*

U.S. Cl. 15—40 **6 Claims**



1. A plant for use in connection with cleaning fire hoses or other similar hoses, said plant comprising an elongated horizontal receptacle, in which a number of hoses may be placed side by side in extended positions, washing equipment provided at one end of the receptacle, and a transport device which is movable along the receptacle and by which a hose may be drawn through the washing equipment and along the receptacle, above the same, in order to be laid down in the receptacle upon the completion of a washing operation on said hose, characterized in that said transport device is formed by a carriage which is supported on rails, provided adjacent to the longitudinal upper edges of the receptacle, and which is provided with means for releasably holding an end portion of a hose in a selected position in the transversal direction of the receptacle.

4,348,782

WINDSCREEN WIPER COMPRISING AN ARM WITH AN ATTACHED END FITTING, IN PARTICULAR FOR MOTOR VEHICLES

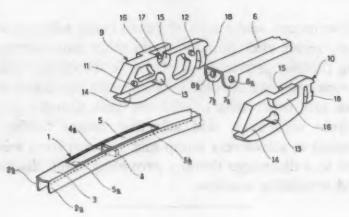
Gerard R. Fournier, Chelles, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France

Filed Jul. 6, 1981, Ser. No. 280,202

Claims priority, application France, Jul. 7, 1980, 80 15081

Int. Cl.³ B60S *1/40*

U.S. Cl. 15—250.32 **15 Claims**



1. In a windscreen wiper comprising a windscreen wiper arm; a windscreen wiper blade fitting carried by said arm, and having two substantially parallel side flanges; an articulated wiper arm end fitting made of a plastic material and carried by the end of the arm, and itself pivotally supporting the wiper blade fitting, said wiper arm end fitting having first and second side surfaces and cooperating with said two substantially parallel side flanges of the said blade fitting, said plastic wiper arm end fitting comprising first and second components, said components including means defining, in assembled configuration of the wiper arm end fitting components, a recess whose shape corresponds to that of said wiper arm which carries the end fitting and which is positioned in said recess; the improvement wherein the thickness of the wiper arm end fitting, measured perpendicularly to said first and second side surfaces of the wiper arm end fitting, is substantially equal to the distance separating said two side flanges of the blade fitting whereby said first and second components of the end fitting may be locked together by the said side flanges after having been inserted therebetween.

4,348,783

SCRUBBING MACHINE WITH SELECTIVE RECYCLE

Albert S. Swanson, Robbinsdale, and Robert A. Geyer, Dayton, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Nov. 10, 1980, Ser. No. 205,294

Int. Cl.³ A47L *11/30*

U.S. Cl. 15—320 **14 Claims**

1. A scrubbing machine comprising:

body means supported on a plurality of wheels;

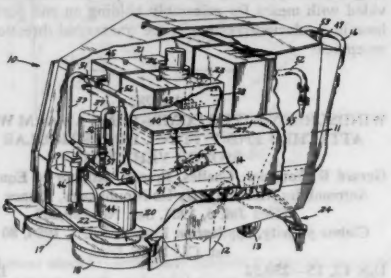
power means for rotatably driving at least one of said wheels;

a pair of tanks adapted to contain scrubbing solution;

means associated with one of said tanks for applying scrubbing solution from said one tank to a surface to be scrubbed;

means for working said solution on said surface;

means associated with the other of said tanks for picking up said solution from said surface to said other tank, said pick up means including a vacuum squeegee and pump means for lifting said solution from said squeegee to said other tank;



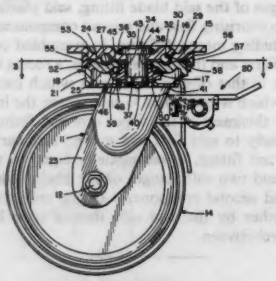
selective means, said selective means being adapted to selectively retain said solution in said other tank during scrubbing thereby providing single cycle scrubbing, said selective means being adapted to selectively pump said solution from said other tank to said one tank thereby providing recycle scrubbing, said selective means further being adapted to selectively pump said solution from said other tank to a discharge thereby providing rapid discharge of used scrubbing solution.

4,348,784

SWIVEL TYPE CASTER WITH SEAL AND LUBRICATION RING

Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jun. 23, 1980, Ser. No. 161,861
Int. Cl.³ B60B 33/00
U.S. Cl. 16—36 **10 Claims**



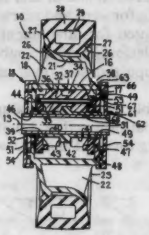
1. A swivel type caster assembly, comprising; horn means carrying an axle, a wheel mounted on the axle for rotation, said horn means having an upper bearing surface, a swivel plate mounted for rotation adjacent said horn means bearing surface, pin means interconnecting the swivel plate and the horn means, a plurality of ball bearings in annular array between the swivel plate and the horn means bearing surface, and a non-metallic seal surrounding and engaging the swivel plate and the horn means to prevent the escape of lubricant from the area of the ball bearings, said seal having a generally radially outwardly extending lubrication fitting communicating with said area.

4,348,785

WHEEL ASSEMBLY

Gerald J. Jordan, P.O. Box 93, Marceline, Mo. 64658

Continuation-in-part of Ser. No. 185,108, Sep. 8, 1980, Pat. No. 4,322,869. This application May 18, 1981, Ser. No. 264,383
Int. Cl.³ A47B 91/00
U.S. Cl. 16—046 **10 Claims**



1. A freely rotatable wheel assembly, comprising:

a one-piece freely-rotatable annular rim having an axially-elongated inner annular hub defining therein an elongated central opening in coaxial alignment with the rotational axis of said rim, said rim being constructed of a hard low-friction material, and said inner annular hub having an inner annular surface thereon which surrounds said opening for defining an outer bearing race;

bearing means positioned within said central opening for creating a low-friction rolling engagement between said rim and a shaft which is coaxially and centrally positionable within said opening;

said bearing means including an inner bearing race member formed as an axially-elongated sleeve which is concentrically disposed within said central opening and spaced radially inwardly from said outer bearing race for defining an annular region therebetween;

said bearing means also including a plurality of cylindrical rollers which are constructed of hard low-friction nonmetallic material, said rollers being positioned within said annular region and being angularly spaced apart around said rotational axis so that the axes of said rollers define a circular locus which is generated about said rotational axis, said rollers being individually disposed in direct rolling engagement with said outer bearing race and with an inner annular bearing race as defined on the exterior periphery of said inner bearing race member;

a pair of end caps fixedly mounted on said rim adjacent the opposite axial ends of said central opening for closing the opposite axial ends of said annular region, at least one of said end caps being fixedly connected to but removable from said rim, said pair of end caps defining therein coaxially aligned central openings which are coaxially aligned with said rotational axis, and said inner bearing race member having opposite end portions thereof which are snugly but rotatably positioned within the central openings defined by said end caps;

each said roller being constructed of one piece and having an encircling annular groove formed therein which separates said roller into two cylindrical roller portions which are both disposed in rolling engagement with the inner and outer bearing races, and said inner bearing race member having an annular rib fixedly and integrally associated therewith and projecting radially outwardly therefrom, said rib being snugly but rotatably accommodated within the annular groove formed on each said roller, said annular rib having opposite side surfaces which are positioned

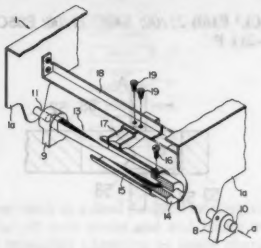
for slidable engagement with annular side surfaces formed on said roller at opposite sides of said groove.

4,348,786

OPENING AND CLOSING APPARATUS

Akira Hirose, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 80,791
Claims priority, application Japan, Oct. 18, 1978, 53/127998
Int. Cl.[3] E05F *1/12, 5/00*
U.S. Cl. 16—75 6 Claims



1. An opening and closing apparatus for opening and closing a swingable member, comprising:

a swingable member which is to be opened and closed with respect to a base member thereof,

support means for supporting pivotally one end portion of said swingable member in a manner that said swingable member can be opened and closed with respect to said base member,

spring means having one end fixed to a portion for supporting said swingable member pivotally, said spring means being adapted to be twisted forcibly in the closing direction of said swingable member, and

transmission means for transmitting the resilient restoring force generated when said spring means is twisted in the closing direction of said swingable member to said swingable member during opening of said swingable member from its closed position, said transmission means being connected to said swingable member through a single arm extending in the vertical plane containing the center of gravity of said swingable member.

4,348,787

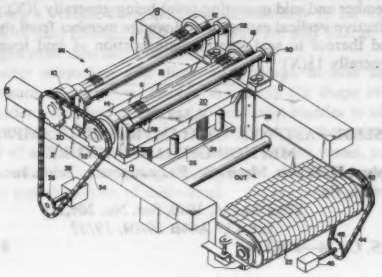
APPARATUS FOR TREATING MEAT PRODUCTS PRIOR TO PACKAGING

Guenter G. Wolff, R.D. 2, Box 441, Leesburg Rd., New Wilmington, Pa. 16142

Filed Sep. 18, 1978, Ser. No. 943,426
Int. Cl.[3] A22C *9/00*
U.S. Cl. 17—27 6 Claims

1. An apparatus for treating meat products comprising:

a conveyor frame having an input end, an output end and a midportion, a first conveyor support roller mounted for rotation at said input end, a second conveyor support roller mounted for rotation at said output end, an endless foraminous metal conveyor passing around and frictionally engaging said conveyor support rollers for transporting said meat products, and having an upper band with an upper surface and a lower surface, said upper band transported from said input end to said output end, a first roller having a plurality of blunt teeth mounted for rotation on said frame above said upper surface for beginning treatment of said meat products, and positioned short of said midportion, a second roller having a plurality of blunt teeth mounted for rotation on said frame above said upper surface and positioned beyond said midportion in a direction of said upper band transport for finishing treatment of said meat products, a first tension plate mounted on said frame below said first roller having a plurality of blunt teeth in pressing relationship with said lower surface comprising said meat products into said first roller having a plurality of blunt teeth and a second tension plate



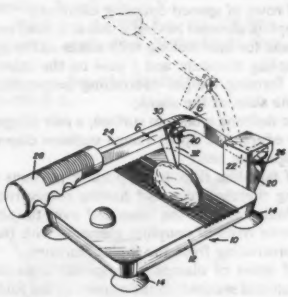
mounted on said frame below said second roller having a plurality of blunt teeth in pressing relationship with said lower surface for compressing said meat products into said second roller having a plurality of blunt teeth.

4,348,788

OYSTER OPENER

Frank C. Jurcak, P.O. Box 124, Lostant, Ill. 61334

Filed May 19, 1980, Ser. No. 151,423
Int. Cl.[3] A22C *29/04*
U.S. Cl. 17—76 4 Claims



1. An oyster opener including a base defining an upwardly facing roughened surface portion, said base including a raised mounting point horizontally spaced to one side of said roughened surface portion, an elongated lever having one end pivotally anchored to said mounting point for swinging movement in an upright plane containing said mounting point and the roughened surface portion and about an axis disposed transverse to said one lever end, an intermediate portion of the said lever being disposed over said roughened portion and including a depending downwardly tapered wedge member supported therefrom for movement toward and away from said roughened surface portion upon similar swinging of said intermediate portion, the other end of said lever defining a handle portion, said wedge member including a generally horizontal lower apex edge extending transverse of said lever and generally paralleling said axis, said roughened surface portion being defined by a plurality of upwardly opening side-by-side grooves formed in the upper surface of said base and disposed generally normal to said plane, said wedge member extending vertically downwardly when said other end portion of said lever is generally horizontally disposed, the lower end of said wedge member being generally horizontally aligned with said

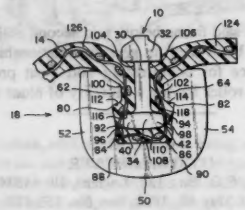
mounting point when said other end portion of said lever is generally horizontally disposed, the lower end of said wedge member being spaced generally (X) distance above said surface portion when said other end of said lever is horizontally disposed, the distance between the lower end of said wedge member and said mounting point being generally 2(X), and the effective vertical extent of said wedge member from the lower end thereof to said intermediate portion of said lever being generally 1½(X).

4,348,789

SLIDE FASTENER WITH IMPROVED CLAMPS AND METHOD OF MANUFACTURE

Robert H. Brown, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Nov. 4, 1980, Ser. No. 204,119
Int. Cl.³ A44B *19/04, 19/32*
U.S. Cl. 24—205.1 R **8 Claims**



1. A slide fastener chain comprising

a pair of rows of spaced coupling elements;

each coupling element having a shank, a head on one end of the shank for interlocking with heads of the opposite row of coupling elements, and a base on the other end of the shank forming flanges protruding perpendicularly from opposite sides of the shank;

each base defining a bottom surface, a pair of opposite outer flange edges, and upper flange surfaces disposed toward the respective head;

a pair of tape-like flexible supporting portions defining an opening therebetween and having respective inner portions folded around the bases and over the shanks of the respective rows of coupling elements with the head portions protruding from the folded portions;

a pair of rows of clamps corresponding to the coupling elements and secured on the outside of the folded portions of the supporting portions to secure the folded portions on the bases and shanks of the corresponding coupling elements;

each clamp having a heel engaging the respective folded portion against the bottom surface of the corresponding base, and having a pair of legs extending from opposite sides of the heel over opposite sides of the respectve folded portion and engaging the respective folded portion with the outer flange edges and with the opposite sides of the shank of the corresponding coupling element;

each pair of legs having respective lips extending inward toward intermediate portions of the opposite sides of the shanks, and having land areas raised toward the respective outer flange edges for positioning the corresponding clamp relative to each coupling element in directions perpendicular to the opposite sides of the shank;

each lip having a lower inner surface facing the respective upper flange surface, and each heel having a flat inner surface positioning the corresponding clamp relative to each coupling element in directions parallel to the shank; and

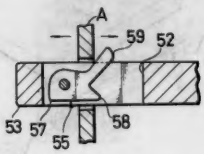
each of said heel and said pairs of legs defining junctions therebetween having substantially reduced thickness relative to central portions of the heels and the legs forming inner corners at the junctions for receiving displaced portions of the flexible supporting portions from between the bottom surface of each base and the flat inner surface of each heel and from between the raised land areas of legs and the outer flange edges.

4,348,790

LOCKING DEVICE

Kikuzo Kuramoto, and Takahiro Enoki, both of Nihonbashi, Japan, assignors to Nisso Industries Co. Ltd., Japan

Filed Dec. 19, 1979, Ser. No. 105,015
Claims priority, application Japan, Dec. 29, 1978, 53-182271[U]
Int. Cl.³ F16B *21/00;* A43C *11/08;* E05C *3/02*
U.S. Cl. 24—211 P **3 Claims**



1. A gravity locking device for locking a brace having an opening therein comprising:

a bar member having a front end engageable into the brace opening, and a groove spaced from said front end defining a thick bar portion;

a stopping piece rotatably mounted in said groove about a pivot axis which is nearer said bar member front end than a center of gravity of said stopping piece;

said stopping piece having an abutment portion extending from a front end of said stopping piece adjacent said bar member front end, engageable with said groove to hold said stopping piece in a locking position;

said stopping piece further including an engaging stop position defining a vertical surface with said stopping piece in its locking position, extending from a rear end of said stopping piece opposite the front end thereof; and

said stopping piece including a projection portion projecting from said stopping piece rear end at an angle to said vertical surface;

said groove extending through said bar member, said engaging stop portion extending from one side of said groove in said stopping piece locking position and projection extendable from an opposite side of said groove with said stopping piece out of its locking position, whereby said projection is engageable by the brace to be locked to rotate said stopping piece into its locking position.

4,348,791

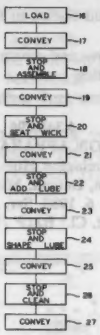
APPARATUS AND METHODS FOR ASSEMBLING END SHIELD ASSEMBLIES FOR DYNAMOELECTRIC MACHINES

James M. Tomson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 7, 1980, Ser. No. 128,085
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—598 **18 Claims**

1. A method of assembling an end shield assembly for an electric motor wherein the assembly includes at least an end frame, a bearing supported by the end frame, lubricant for the bearing, a feed wick for transmitting lubricant to the bearing, and an oil well cover that at least partly defines a lubricant storage reservoir, the method comprising: intentionally placing a feed wick on the end frame in a proper temporary position relative to the end frame wherein such proper temporary position is improper for properly feeding oil to a shaft but proper for permitting mechanized assembly of an oil well cover and end frame; assembling an oil well cover with the end

frame by pressing the oil well cover onto a centrally located hub that forms part of the end frame and thereby substantially surrounding the temporarily properly positioned feed wick;



seating the feed wick in a final position relative to the oil well cover after the oil well cover and end frame are assembled together; and thereafter admitting an initial charge of bearing lubricant to the oil reservoir.

4,348,792

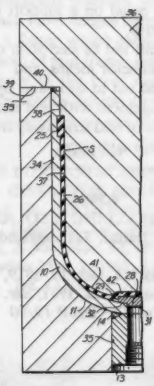
METHOD OF MAKING LOW COST ACCUMULATOR

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.

Filed Nov. 18, 1980, Ser. No. 207,883

Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*

U.S. Cl. 29—157 R **3 Claims**



1. The method of manufacturing a hydraulic accumulator device of the type which comprises a pressure vessel including an oil port at one end, a gas charging port at the other end and a resilient elastomeric bladder member disposed within said vessel and dividing the same into two chambers in communication, respectively, with said oil port and said gas port, which comprises the steps of

providing a pressure vessel in the form of a generally cylindrical shell having an open mouth portion at one end, a restricted orifice defining an oil port at the other end, and an internal annular retainer groove adjacent said open mouth portion,

providing a valve button member sized to seal said oil port, seating said button in sealing position of said oil port,

applying a bonding agent to the walls defining said groove and to surfaces of said button,

thereafter introducing into the interior of said vessel a volumetrically controlled charge of uncured elastomeric prepolymer,

thereafter introducing concentrically into said pressure vessel a male mold member sized to define with the interior of said vessel and button a predetermined clearance space, having a volume corresponding substantially to the volume of said change, thereby to distribute said charge of prepolymer into said clearance space,

thereafter subjecting said distributed charge to heat and pressure to cause said charge to cure in the shape of a bladder lining said vessel, and to bond said bladder to said button and said annular groove while leaving the remainder of said bladder free of connection to said vessel, and thereafter securing a cap having a gas charging port to said mouth portion of said vessel.

4,348,793

METHOD OF CONNECTING A PLATE-SHAPED ABSORBER FOR SOLAR HEAT TO A TUBULAR HEAT TRANSPORT SYSTEM

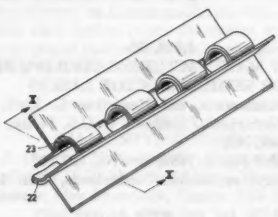
Herman Bloem, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1980, Ser. No. 158,001

Claims priority, application Netherlands, Jun. 29, 1979, 7905056

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157.3 A **2 Claims**



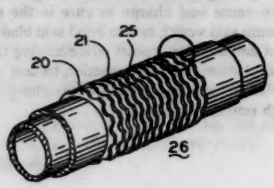
1. A method of connecting a straight tubular metal heat pipe having an evaporator section and a condenser section to two elongate flat solar-heat metal absorber plates, which comprises forming a plurality of equally spaced parallel cuts in each absorber plate, said cuts extending transversely of the longitudinal direction of each absorber plate; disposing the two absorber plates one on the other with their respective parallel cuts in alignment; deforming alternate portions between consecutive cuts in opposite directions to provide alternate oppositely disposed semi-cylindrical portions, the two absorber plates remaining in contact with each other; inserting the evaporator section of the tubular heat pipe in the cylindrical space formed by said alternate oppositely disposed semi-cylindrical portions; mechanically pressing said semi-cylindrical portions against the evaporator section of the heat pipe to clamp the absorber plates thereto and to provide thermal conductive contact therewith; and bending the respective remainders of the two absorber plates away from each other into an outwardly extending X-shape with respect to the heat pipe.

4,348,794

DOUBLE-WALLED FINNED HEAT TRANSFER TUBE

Sung C. Kim, Des Plaines, and Marvin P. Schwartz, Arlington Heights, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 903,049, May 5, 1979, Pat. No. 4,232,735.
This application Jul. 11, 1980, Ser. No. 168,033
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 AH 7 Claims



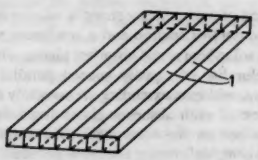
1. The method of forming a double-walled heat transfer tube comprising the steps of:
(a) forming an elongated inner tubular member;
(b) forming an elongated outer tubular member having dimensions such that said ouer tubular member fits over said inner tubular member;
(c) subjecting at least a portion of the outside surface of said outer tubular member to an operation so as to produce external fins on the outer tubular member;
(d) assembling said inner tubular member inside outer tubular member;
(e) subjecting said assembly to inward crimping forces to lock said inner tubular member within said outer tubular member
and to reshape said outer tubular member to form a plurality of radial convexities and concavities, the inner surface of said convexities being in intimate contact with the outer surface of said inner tubular member and said radial concavities forming channels between said inner and outer tubular members.

4,348,795

METHOD OF MANUFACTURING COOLING BLOCKS FOR SEMICONDUCTOR LASERS

Anthony H. Deunhouwer, and Hendrikus G. Kock, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 6, 1980, Ser. No. 157,139
Claims priority, application Netherlands, Jun. 11, 1979, 7904550
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—411 5 Claims



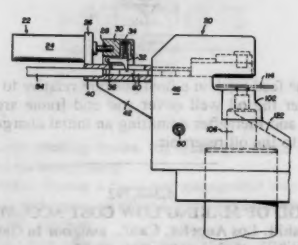
1. A method of manufacturing cooling blocks for semiconductor lasers, which comprises:
providing each of a plurality of bodies to be formed into cooling blocks with flat surfaces;
fastening said flat surfaces together with a thin layer of a curing adhesive;
machining said bodies in a direction transverse to that of said flat surfaces to obtain a further flat surface which intersects said flat surfaces of said bodies to define edges for each of said bodies, said edges having rounding-off radii of less than about two microns, said thin layer of curing adhesive substantially preventing deformation and burring of the edges of said bodies at said further flat surface during machining;
further machining said bodies to form said cooling blocks; and
removing said adhesive and separating said bodies into individual cooling bodies.

4,348,796

NUT INSTALLATION APPARATUS AND METHOD

Jon M. Smallegan, Farmington Hills, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Feb. 6, 1980, Ser. No. 118,931
Int. Cl.³ B21P *19/04*
U.S. Cl. 29—432 11 Claims



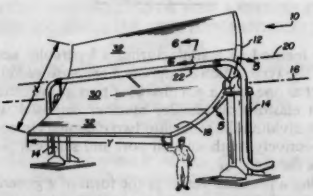
1. A method of attaching nuts to a panel, said nuts interconnected by frangible connector means in serial alignment to form a strip of nuts, the method comprising the steps of:
(a) supporting said panel on a support means opposite the end nut of said strip,
(b) removing the end nut of said strip of nuts by breaking said frangible connector means, and
(c) attaching said end nut to said panel by moving said panel into locking engagement with said end nut while moving the remaining nuts of said strip away from the engagement of the end nut with said panel.

4,348,797

METHOD OF INSTALLING A SOLAR COLLECTOR

Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Division of Ser. No. 86,314, Oct. 19, 1979, Pat. No. 4,297,003.
This application Jun. 22, 1981, Ser. No. 275,636
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—434 2 Claims



1. A method of installing an extended width parabolic trough type solar collector comprising the steps of: (a) erecting at least two vertically extending supports: (b) pivotally supporting a central module having a curved front surface on a front skin and a spaced rear skin from said supports to extend horizontally between said supports whereby said module will rotate about a horizontally extending axis; (c) connecting at

least one wing module to an edge of said center module in a position whereby the front surface of said center module and the front surface of said wing module cooperate to form a single parabolic surface.

4,348,798

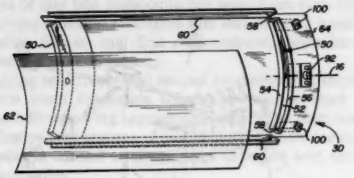
METHOD OF MANUFACTURING SOLAR COLLECTOR MODULE

Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Division of Ser. No. 86,314, Oct. 19, 1979, Pat. No. 4,297,003. This application Jun. 22, 1981, Ser. No. 275,637

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—448 **3 Claims**



1. A method of manufacturing a curved solar collector module comprising the steps of: forming a plurality of bulkheads and connector means with at least one corresponding front edge of each of said bulkheads conforming to a predetermined curved shape; forming flanges on the front and rear edges of said bulkheads and said connector means; forming a rigid four-sided curved frame by rigidly affixing connector means to spaced bulkheads whereby said bulkheads and said connector means each have flanges extending outwardly from said frame to form a flange which extends around each of the front and rear surfaces of said frame; rigidly affixing front and rear skins respectively to the front and rear flanges of said frame to form a monocoque having a curved front surface.

4,348,799

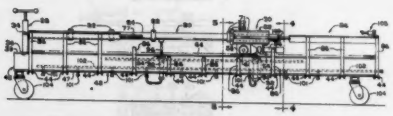
APPARATUS FOR INSTALLING ROLLS ON A CONVEYOR SHAFT

Tom J. Lord, Athens, Ga., and William V. Snyder, Carlisle, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 22,906, Mar. 22, 1979, Pat. No. 4,279,071. This application Mar. 2, 1981, Ser. No. 239,255

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—450 **1 Claim**



1. A method of mounting rings made of resilient, flexible material on a rigid shaft wherein outside diameter of the shaft is at least equal to inside diameter of the rings, comprising the steps of:

mounting the shaft against movement in a predetermined direction along a path generally parallel to the longitudinal axis of the shaft;

supporting the shaft in the path by engaging the shaft at selected positions intermediate to its ends;

moving a ring over the shaft;

disengaging the shaft at the selected positions as the ring moves toward the selected positions;

engaging the shaft at the selected positions as the ring passes the selected positions;

positioning the ring in a preselected position on the shaft; and

repeat the above steps to mount additional rings on the shaft.

4,348,800

PRODUCTION OF STEEL PRODUCTS WITH MEDIUM TO HIGH CONTENTS OF CARBON AND MANGANESE AND SUPERIOR SURFACE QUALITY

Dionisyj Demianczuk, Parma; Gregory J. McLean, Brecksville, and Joseph E. Franklin, Medina, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Apr. 14, 1980, Ser. No. 139,873

Int. Cl.³ B22D *23/06*

U.S. Cl. 29—527.7 **9 Claims**

1. A method of making a high-strength steel product, comprising pouring an ingot mold 80% to 95% full of molten steel consisting essentially of 0.01 to 0.12% C, 0.1 to 0.6% Mn, 0 to 2.0% Cu, 0.15 max. % P, and 0.20 max. % S, balance iron and incidental elements, allowing said filling to undergo rimming action while a shell of rimmed steel solidifies next to the mold surrounding a still-molten core, and then completing pouring of said molten steel into said ingot mold while adding to the molten steel in the mold sufficient carbon so that the core of the ultimate, filled ingot contains carbon in the range above 0.12%, to 0.9%, said addition to the molten steel in the mold during said completion of pouring also including adding material to provide a total core content of 0 to 0.20% P, 0 to 0.5% S, 0 to 3.5% Si, 0 to 0.5% Al, 0 to 0.75% of each of one or more of the elements Cb, V, Ti and Zr, 0 to 0.075% B, 0 to 2.0% Cu, 0 to 2.0% Cr, 0 to 3.5% Ni and 0 to 1.0% Mo; and after solidification of the said ferrite-shell-carrying ingot, converting, by rolling, that part of the solid ingot which was poured first and which constitutes at least about the lower 80% of the solid ingot, to a rolled product having a skin of rimmed steel which is essentially ferrite over the principal surface area of the product, and beneath said skin a core containing carbon in greater proportion than 0.12%, said addition of carbon during said completion of pouring of the first-defined molten steel being effected by injecting solid material containing carbon so that such carbon enters the molten steel in the mold while the stream of molten steel, which completes the pouring, falls into the steel in the mold.

4,348,801

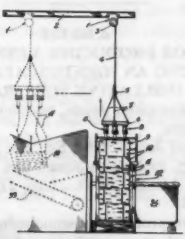
BALE UNTYING MACHINE

Antonio J. Dumont, 74 Boucher St., Edmundston, New Brunswick, Canada E3V 1P7, and Mario Theriault, R.R. #1, Edmundston, New Brunswick, Canada E3V 3K3

Filed Sep. 16, 1980, Ser. No. 187,952

Int. Cl.³ B26D *7/02*; B65B *69/00*

U.S. Cl. 29—564.3 **7 Claims**



1. A bale untying tool comprising a first catch member having a lateral projection engageable under a tie secured around a bale of material, said lateral projection having a first cutting edge at one end and a tie-supporting surface adjacent

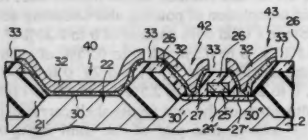
said first cutting edge, a second catch member movably mounted on said first catch member and co-operating with said tie-supporting surface to engage and clamp said tie with said tie extending over said cutting edge, a cutter member mounted on said first catch member for movement relative to the same independently of said second catch member and having a second cutting edge co-operable with said first cutting edge to engage and shear said tie, means to move said cutter member towards and away from said first cutting edge, biasing means extending between said second catch member and said cutter member and biasing said second catch member to clamp said tie against said tie-supporting surface prior to shearing of said tie by said cutting edges, and means operable by movement of said cutter away from said first cutting edge to cause release of said tie by said second catch member.

4,348,802

PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE

Takehide Shirato, Hiratsuka, Japan, assignor to Fijitsu Limited, Kawasaki, Japan

Filed Apr. 11, 1980, Ser. No. 139,168
Claims priority, application Japan, Apr. 18, 1979, 54-47417
Int. Cl.³ H01L *21/208, 21/26, 21/28*
U.S. Cl. 29—571 **13 Claims**



1. A process for producing a semiconductor device with shallow doped regions in a substrate and at least one substrate contact, said process comprising the steps of:

defining on said semiconductor substrate borders of at least one semiconductor element region wherein said shallow doped regions are to be formed and at least one substrate-contact region;

forming on each said semiconductor element region at least one layer of a material which is comprised in a part of a semiconductor element, this part being located on the surface of said substrate, and simultaneously forming on said at least one substrate-contact region masking layer consisting of said material;

doping each said shallow region while preventing the doping of said substrate contact-region by use of said masking layer; and

thereafter, removing said masking layer and forming on each said substrate-contact region a contact electrode which is ohmically connected to said semiconductor substrate.

4,348,803

PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE HAVING AN IDENTIFICATION MARK IN AN INSULATING SUBSTRATE

Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

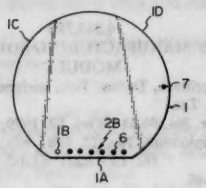
Filed Jun. 4, 1980, Ser. No. 156,372
Claims priority, application Japan, Jun. 4, 1979, 54-69798
Int. Cl.³ H01L *21/66, 21/84*
U.S. Cl. 29—574 **23 Claims**

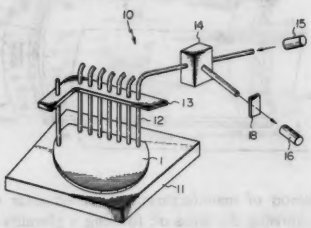
1. A process for producing a semiconductor device having a identification mark in an insulating substrate, said device including a semiconductor layer formed on said insulating substrate and semiconductor elements formed in said semiconductor layer, said process comprising the steps of:

selecting said insulating substrate to be of sapphire or spinel;

ion implanting a selected material into a selected part of said insulating substrate, said selected material comprising chromium or titanium; and

completing the formation of said semiconductor device, wherein





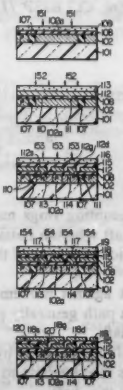
a selected one of said steps of ion implanting and completing the device formation includes a heating of said substrate for developing said identification mark.

4,348,804

METHOD OF FABRICATING AN INTEGRATED CIRCUIT DEVICE UTILIZING ELECTRON BEAM IRRADIATION AND SELECTIVE OXIDATION

Mitsuru Ogawa, Fuchu, and Seiichi Iwamatsu, Hamuramachi, both of Japan, assignors to VLSI Technology Research Association, Kanagawa, Japan

Filed Jul. 10, 1979, Ser. No. 56,239
Claims priority, application Japan, Jul. 12, 1978, 53-84030; Jul. 26, 1978, 53-90496
Int. Cl.³ H01L *21/302, 21/312*
U.S. Cl. 29—580 **6 Claims**



1. A method of fabricating a semiconductor integrated circuit device comprising the steps of:

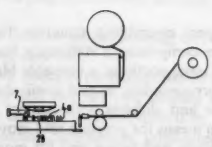
(a) forming a first insulation film on a first semiconductor layer formed on an insulation substrate;
(b) removing selectively said first insulation film linearly along the profiles of first desired pattern regions in which circuit elements are to be formed in said first semiconductor layer through electron beam irradiation thereby to form a first linear aperture pattern in said first insulation film;
(c) etching selectively first semiconductor layer exposed in said first aperture pattern in said first insulation film thereby to form in said first semiconductor layer a groove which is located along said profiles of first desired pattern regions and penetrates said first semiconductor layer;
(d) oxidizing the wall of said groove so as to completely fill said groove with formed oxide of said semiconductor layer at substantially the same time thereby to form an isolating oxide region which isolates said first pattern regions of said first semiconductor layer from each other;
(e) removing said first insulation film and forming a second insulation film on said first semiconductor layer having said isolating oxide region;
(f) removing selectively said second insulation film through electron beam irradiation thereby to form at least one aperture for allowing impurity diffusion to at least one of said first pattern regions of said first semiconductor layer;
(g) forming a second semiconductor layer on said second insulation film;
(h) removing selectively said second semiconductor layer through electron beam irradiation along the profiles of second desired pattern regions in which wirings are to be formed in said second semiconductor layer thereby to form a second linear aperture pattern; and
(i) diffusing impurity contained in the pattern regions of said second semiconductor layer selectively into at least one of the first pattern regions of said first semiconductor layer through said aperture formed in said second insulation film.

4,348,805

METHOD FOR THE PRODUCTION OF WIRING LOOMS

Ralph D. Gibbons, Basingstoke, England, assignor to Lansing Bagnall Limited, Hampshire, England

Filed Jun. 13, 1979, Ser. No. 48,582
Claims priority, application United Kingdom, Jun. 15, 1978, 27015/78
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—857 **4 Claims**



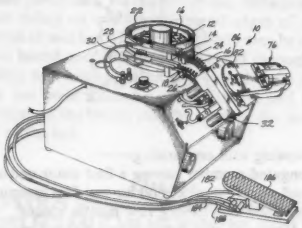
1. A method of providing wires for making a wiring loom, using a loom board adapted to receive releasable guide pins such that said guide pins protrude from a surface of said loom board, and an automatic manipulator means which moves and is actuated in accordance with pre-programmed stored commands, the method comprising the steps of:
(i) causing said manipulator means to remove said guide pins from a supply thereof and to place said guide pins at predetermined positions on said loom board so that said guide pins project from said loom board surface and define a plurality of predetermined paths for wires of said loom, each of said paths extending between said guide pins defining the respective path;
(ii) presenting a plurality of wires from supplies thereof;
(iii) causing said manipulator means to grip a selected wire;
(iv) feeding a predetermined length of the selected wire to the said manipulator means;
(v) cutting the wire to sever the length thereof;
(vi) causing the said manipulator means to anchor the length of wire at one end thereof and to lay said length along a respective one of said predetermined paths;
(vii) repeating the steps (iii) to (vi) so that a length of a respectively selected wire is laid along each of said predetermined paths;
(viii) fastening the lengths of wire together while they are located along said predetermined paths, so as to form a bundle of wires constituting the required wiring loom; and
(ix) removing said bundle of wires from said loom board.

4,348,806

SELECTIVE CONTACT CRIMPER

William J. Eves, Woodinville, and Luis J. Lazaro, Jr., Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 17, 1980, Ser. No. 130,791
Int. Cl.³ H01R *43/04*; B23P *19/00*
U.S. Cl. 29—863 **17 Claims**



1. An apparatus for selectively crimping one of a pair of contacts comprising: means for automatically feeding a succession of first wire contacts to a first reference hole in a guide block, means for automatically feeding a succession of second wire contacts to a second reference hole in the guide block, a crimping device above the guide block and pivotally mounted on said apparatus to permit selectively positioning a crimping head in alignment with one of the reference holes in the guide block, and means for selectively moving one of the wire contacts in the reference hole up to the aligned crimping head for crimping to a wire end.

14. A method for selectively crimping one of a pair of wire contacts, with steps comprising separately feeding two separate lines of wire contacts into terminating parallel holes in a guide block, selectively placing a crimper head of a pivotally mounted crimper into alignment with the parallel holes, raising a contact from one of said separate lines located in an aligned one of said terminating parallel holes up into the crimper, and placing a wire end into the contact and crimping.

4,348,807

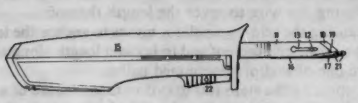
PEELING DEVICE

Raymond G. Ashdown, and Barbara P. Ashdown, both of 32 Nundah St., Kedron, Queensland, 4031, Australia

Filed Feb. 19, 1981, Ser. No. 236,059
Claims priority, application Australia, Feb. 28, 1980, PE 2586
Int. Cl.³ A47J *17/02*; B26B *7/00*
U.S. Cl. 30—123.6 **6 Claims**

1. A vegetable peeler including:
a pair of arms interconnected adjacently for relative reciprocal movement,
a cutter on each arm, the cutters extending laterally in opposite directions from the adjacent arms and having cutting leading edges,

means for reciprocating the arms and the cutters thereon so one cutter is advanced as the other is retracted, and



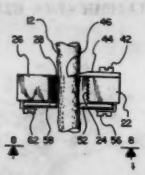
depth gauge means connected to the cutters for limiting their penetration into an article being peeled thereby.

4,348,808

HARVESTING TOOL

Harutyun G. Nalbandyan, 4421 Melbourne Ave. #5, Los Angeles, Calif. 90027

Filed Dec. 15, 1980, Ser. No. 216,294
Int. Cl.³ B26B *13/20*
U.S. Cl. 30—134 **4 Claims**



1. A harvesting tool comprising:

a first elongated member having a first outer end and a first inner end, said first outer end having first grasping means, said first inner end having first handle means;

a second elongated member having a second outer end and a second inner end, said second outer end having second grasping means, said second inner end having second handle means, said second elongated member being pivotally connected by pivot means to said first elongated member, said pivot means being located intermediate said ends of both said first and second elongated members, said first grasping means to cooperate with said second grasping means to facilitate manual grasping and holding of a plant stem;

said first grasping means including a first preliminary grasping member and a first main grasping member, said second grasping means including a second preliminary grasping member and a second main grasping member, said first and second main grasping members to be in secure contact with the plant stem when said first main grasping member is located directly adjacent said second main grasping member, initial grasping of the plant stem is achieved by the combined grasping action of said first and second preliminary grasping members prior to movement into contact with the plant's stem by said first and second main grasping members; and

cutting means mounted on said first outer end for cutting the plant stem.

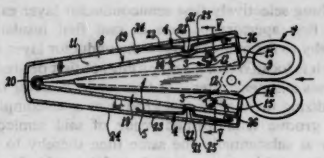
4,348,309

COMBINATION SHARPENER DEVICE AND SCISSORS

Dennis B. Jackson, Nunawading, Australia, assignor to Wiltshire Cutlery Company Proprietary Limited, South Melbourne, Australia

Filed Nov. 19, 1979, Ser. No. 95,264
Int. Cl.³ B24B *3/52*
U.S. Cl. 30—138 **12 Claims**

1. In combination, a sharpening device and scissors, the sharpening device including, a hollow housing for receiving scissor blades, a pair of sharpener units located within said housing adjacent an open front end thereof and being arranged in opposed relationship to receive said blades between them, means mounting at least one said sharpener unit for movement towards and away from the other, and biasing means acting on said movable sharpener unit to urge it in a direction towards the other said sharpener unit, the scissors having two pivotally connected blades each having a cutting edge and a back edge,



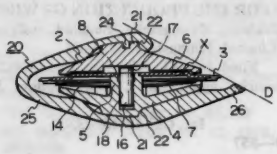
the scissors having a closed condition in which the cutting edge of each blade is in substantially the same plane as the back edge of the other blade, so that upon passing the blades between the sharpener units of the sharpening device material is removed simultaneously from a respective said cutting edge and the adjacent said back edge.

4,348,810

BLADE PART ASSEMBLING STRUCTURE FOR ELECTRIC SHAVER

Takeshi Oda, and Hiroshi Kikuchi, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP79/00165, § 371 Date Feb. 29, 1980, § 102(e) Date Feb. 29, 1980, PCT Pub. No. WO80/00141, PCT Pub. Date Feb. 7, 1980
PCT Filed Jun. 26, 1979, Ser. No. 250,741
Claims priority, application Japan, Jun. 30, 1978, 53/80383
Int. Cl.³ B26B *19/04*
U.S. Cl. 30—210 **9 Claims**



1. A blade part assembling structure for electric shaver characterized in comprising a stationary blade having comb-shaped teeth at edge portions, a movable blade having comb-shaped teeth corresponding to said comb-shaped teeth of said stationary blade and slidable with respect to the stationary blade, a push-up means for pressing said movable blade against the stationary blade, and fitting pins for mounting the stationary blade to a base, said fitting pin being formed to be rectangular or elliptic at upper end flange part and being rotatably fitted to be at least displaceable in a first position where the lengthwise direction of said upper end flange part coincides with sliding direction of the movable blade and a second position where the lengthwise direction of the upper end flange part coincides with the direction intersecting at right angles said sliding direction of the movable blade, said movable blade being provided with fitting holes longer in the sliding direction of the movable blade than the length in the lengthwise direction of the upper end flange part of the fitting pin but shorter in the direction intersecting at right angles the sliding direction, said stationary blade being provided with fitting holes shorter in the sliding direction than the length in the lengthwise direction of the upper end flange part of the fitting pin but longer in the direction intersecting at right angles the sliding direction, said movable blade allowing the flange parts of the

fitting pins to pass through its fitting holes in said first positions of the fitting pins to mount the blade to the blade holder and allowing the lower surfaces of the flange parts to engage with the peripheral edges of the short sides of the fitting holes in the second positions of the fitting pins, and said stationary blade further allowing the flange parts of the fitting pins to pass through the fitting holes in the second positions of the fitting pins to mount the blade to the base and allowing the lower surfaces of the flange parts to engage with the peripheral edges of the short sides of the fitting holes in the first positions of the fitting pins.

4,348,811

VEE BELT MEASURING APPARATUS

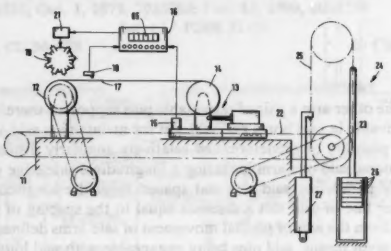
Wilhelm Brand, and Dietmar Baasner, both of Hanover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover Kleefeld, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,073

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948087

Int. Cl.³ G01B *5/10*

U.S. Cl. 33—125 R **10 Claims**



1. Apparatus for measuring the length of a vee belt, comprising

(a) a machine bed mounted on a frame;

(b) first and second measuring pulleys mounted above said bed and each having an axis of rotation;

(c) a tensioning carriage mounted for longitudinal movement on said machine bed and having mounted thereon said second pulley, movement of said carriage along said machine bed varying the distance between the axes of said pulleys;

(d) a drag chain fixed to said tensioning carriage for moving the same along said bed;

(e) a travel drive operatively connected to said drag chain for selectively and alternatively driving said drag chain and thus said carriage in a first direction;

(f) tensioning means operatively connected to said drag chain for selectively acting on said drag chain for moving said chain and said carriage in the opposite direction, said tensioning means including an endless chain with disc-shaped tensioning weights hooked onto said endless chain, a cylinder to guide said weights and a pair of gripping tongs adjustably mounted on said cylinder, said tongs engaging through apertures in said cylinder to engage said weights selectively in different combinations;

(g) an absolute length measuring device;

(h) an electronic control and arithmetic unit adapted to receive an input from said absolute length measuring device, said control and arithmetic unit having an assessing circuit to compare an actual measured value of the length of the vee belt with stored values of part-ranges of an appropriate length tolerance of said vee belt, and

(i) recording means to mark the vee belt if it has been measured and allocated to a tolerance part-range.

4,348,812

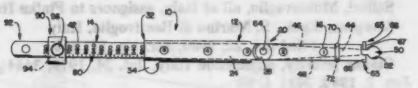
GUN BARREL INTERNAL DIAMETER INDICATOR

Forest L. Middleton, 611 Bowens Mill Rd., Middleville, Mich. 49333

Filed Jan. 29, 1981, Ser. No. 229,332

Int. Cl.³ G01B *5/12*

U.S. Cl. 33—147 K **17 Claims**



1. A bore gauge for checking the internal diameter of a gun barrel, said gauge comprising:

an elongated, one-piece body defining a generally rectangular through passage and a pair of transversely spaced pivot ears on one end;

an elongated, flat bar slidably disposed within said body, said bar including an indicator portion and a tapered portion having converging lateral edges; and

a pair of flat arms, each arm including an end pivoted to one of said pivot ears, each arm further including a cam follower riding on one of said lateral edges of said tapered portion of said bar whereby said body may be inserted into a gun barrel and said bar may be slid through said body causing said arms to pivot and spread apart into contact with the inner diameter of said barrel and the internal diameter of the barrel may be read on the indicator portion of the bar.

4,348,813

ELEVATION MEASURING INSTRUMENT WITH SELECTABLE MEASUREMENT SCALES

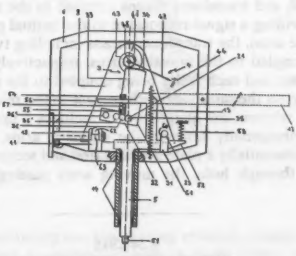
Jean Berney, Les Bioux, France, assignor to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Filed Dec. 12, 1980, Ser. No. 215,860

Claims priority, application Switzerland, Dec. 14, 1979, 11075/79

Int. Cl.³ G01B *3/22*

U.S. Cl. 33—172 R **16 Claims**



1. A microcomparator measuring instrument comprising a housing, and a feeler extending therefrom, a feeler piston activated by said feeler, said piston being axially displaceable, an amplification mechanism for amplifying the displacements of the feeler piston onto display means, said amplification mechanism and said display means being mounted in a carriage disposed in said housing, said amplification means comprising an L-shaped lever pivoting around an axle at its base in relation to the carriage, said L-shaped lever having a longer leg segment and a shorter foot segment, said display means driven by the longer leg segment of said lever, wherein said shorter foot segment contacts a rectilinear bearing edge of a stop mounted on said feeler piston, said shorter foot segment comprising a plurality of adjacent cylindrical calibrated rods mounted paral-

lel to the pivoting axle of the lever, said scale of amplification being changed as said contact surface bears on a selected rod of said plurality of calibrated rods.

4,348,814

GAUGE FOR CHECKING LINEAR SIZES OF MECHANICAL PARTS

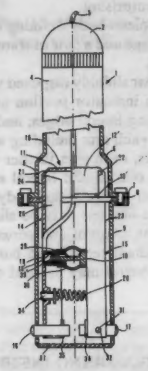
Mario Possati; Guido Golinelli, both of Bologna, and Narciso Selleri, Monteveglio, all of Italy, assignors to Finike Italiana Marposs, S.p.A., S. Marino di Bentivoglio, Italy

Filed Jul. 22, 1980, Ser. No. 171,160

Claims priority, application Italy, Jul. 24, 1979, 3464 A/79; Jun. 2, 1980, 3432 A/80

Int. Cl.³ G01B *5/12*

U.S. Cl. 33—178 E **12 Claims**



1. A gauge for checking linear sizes of mechanical parts, comprising: a support; an integral member including a first section coupled to the support, two resiliently flexible sections connected to the first section and defining relevant fulcrum devices; two further sections, each defining a relevant movable arm, connected to the flexible sections for rotation movement about the relevant fulcrum devices; two feelers coupled to the movable arms, respectively, for contacting the part to be checked; and transducer means coupled to the movable arms for providing a signal responsive to the mutual position of the movable arms, the transducer means including two transducer parts coupled to the movable arms, respectively, each transducer part and each feeler being coupled to the relevant movable arm on the same side with respect to the relevant fulcrum device, wherein the gauge further includes a protective nosepiece substantially housing the movable arms, said support being substantially a plate defining first and second sides and at least a through hole, the moving arms passing through the plate.

4,348,815

MULTI-PURPOSE SQUARE

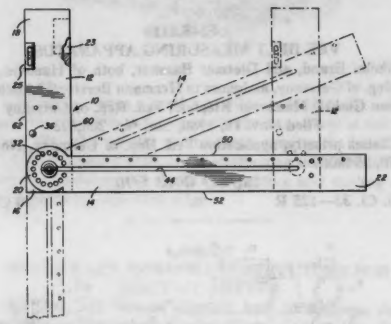
Alfred A. Hurt, 116 Harvey Ave., Oak Hill, W. Va. 25901

Filed Nov. 13, 1980, Ser. No. 206,473

Int. Cl.³ B43L *7/06*

U.S. Cl. 33—419 **7 Claims**

1. In combination, elongated first and second arms including corresponding base and free ends, pivot means pivotally connecting said base ends for relative angular displacement of said arms a full 360°, said pivot means and one of said arms including means operative to variably adjustably position said pivot means longitudinally of said one arm toward the free end thereof, said first and second arms including coacting latch means operative to releasably lock said arms in a plurality of predetermined relatively angularly displaced positions when said pivot means is disposed adjacent the base end of said one arm, said latch means also including means operative to releasably lock said arms in 90° relative positions during at least a major portion of the total length of adjustment of said pivot means along said one arm from said base end thereof toward the free end thereof, said pivot means comprising a pivot shank carried by the other arm and a longitudinal slot formed in said one arm through which said shank is received, said latch means including on the base end of said one arm a circular arrangement of a plurality of bores equally spaced from and disposed about the adjacent end of said slot, said slot being of a width substantially equal to the diameter of said bores and equally spaced between a pair of said bores, said latch means including



on the other arm a pair of retractable pins supported therefrom receivable in said bores and said slot for maintaining said arms in a plurality of predetermined relatively angularly displaced positions, said one arm including a longitudinal side edge generally paralleling said slot and spaced from the longitudinal center line of said slot a distance equal to the spacing of said pins from the axis of pivotal movement of said arms defined by said pivot means, said pins being engageable with said longitudinal side edge when said arms are disposed at 90° relative to each other and said pivot means is spaced along said slot toward the free end of said one arm in order to lock said arms in right angularly disposed positions.

4,348,816

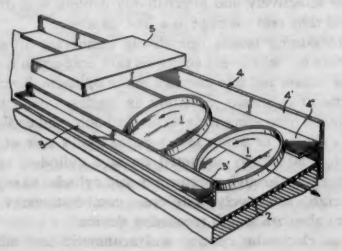
METHOD AND APPARATUS FOR RAPID DRYING OF CONTAINER COVERS

Raimondo Arippol, Avenida dos Autonomistas 1117, Osasco, Sao Paulo, Brazil

Filed Jan. 29, 1981, Ser. No. 229,657

Int. Cl.³ F26B *3/04*

U.S. Cl. 34—13 **16 Claims**



1. A method of drying a substantially flattened and approximately circular workpiece comprising:

transporting said workpiece on an apparatus comprising a structural support having

conveyor belt means movably mounted therein and adapted to transport said workpiece, said conveyor belt

means having a first lateral edge and a second lateral edge,

an upstanding laterally fixed elevated guide means comprising an inwardly-projecting substantially horizontal member and an upwardly-projecting member extending therefrom, said elevated guide means extending above and parallel to the second lateral edge, and

an upstanding laterally fixed deflector guide means extending parallel to the first lateral edge, such that the workpiece is transported by the conveyor belt means in a plane defined by the first lateral edge and the elevated guide means at an acute angle, the workpiece having both a rotational motion and a linear motion imparted to it by the movement of the conveyor belt means; and

heating the workpiece with a heating means disposed along said conveyor belt means capable of evaporating liquids associated with said workpiece.

4,348,817
DRYING APPARATUS

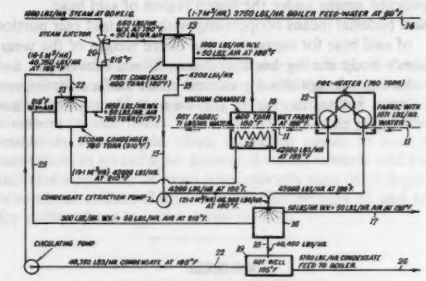
William Bradshaw, Rimington, nr. Clitheroe, England, assignor to Edgar Pickering (Blackburn) Ltd., Lancashire, England

Filed May 5, 1980, Ser. No. 146,431

Claims priority, application United Kingdom, May 11, 1979, 7916514; Oct. 1, 1979, 7933983; Feb. 13, 1980, 8004758

Int. Cl.³ F26B *21/08*

U.S. Cl. 34—75 **20 Claims**



1. Apparatus for drying a material by removing a quantity of a wetting liquid from the material in the form of a vapour, through evaporation of the wetting liquid from the material, the apparatus comprising:

i. a drying chamber;

ii. a vapour condenser in which at least some of the vapour is contacted by a supply of the wetting liquid thereby to condense the vapour in the liquid supply and transfer the associated latent heat of condensation to the supply of wetting liquid;

iii. a reservoir for the heated wetting liquid, including condensed vapour, from the condenser;

iv. means to maintain the temperature of the reservoir higher than the temperature of the vapour in the drying chamber;

v. fluid connections between the chamber and the condenser, and the condenser and the reservoir;

vi. means for flowing the vapour from the chamber to the condenser;

vii. a heat exchanger within the drying chamber for imparting heat to the material to be dried;

viii. a fluid connection between the reservoir and the heat exchanger; and

ix. means for flowing the wetting liquid from the reservoir to and through the heat exchanger; whereby such latent heat as is given out by condensation of the vapour within the condenser is absorbed by the liquid supply and carried thereby from said condenser to the heat exchanger for heating the material to be dried.

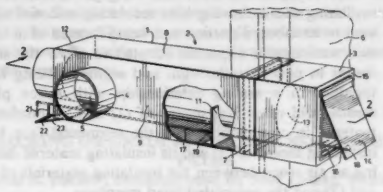
4,348,818
DEVICE FOR RECOVERING THE EXHAUST HEAT OF A CLOTHES DRYER

Robert C. Brown, P.O. Box 62, Stroud. Ontario, Canada L0L 2M0

Filed Jul. 24, 1980, Ser. No. 171,900

Int. Cl.³ F26B *11/04*

U.S. Cl. 34—77 **11 Claims**



1. A device for recovering heat from an appliance located in a building which provides an exhaust of warm moist air, comprising an appliance exhaust duct connectable between the exhaust outlets of the appliance and a condensing chamber placed outside of the building, the chamber being cooled by direct contact with the ambient air external to the building and being capable of condensing moisture from the exhaust when the ambient air external to the building is sufficiently cool, means for draining condensate from the condensing chamber, and a return duct having an outlet to allow warm dry air to flow from the condensing chamber into the building.

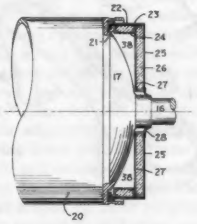
4,348,819
HEATED CAN ROLLS OF HIGH THERMAL EFFICIENCY

James E. Gamble, 436 Orchard Rd., Newark, Del. 19711

Filed Sep. 18, 1978, Ser. No. 942,942

Int. Cl.² F26B *13/08*

U.S. Cl. 34—110 **6 Claims**



1. In a papermaking machine having multiple cylindrical can rolls for drying a continuous sheet of paper fibers, said can rolls:

A. being comprised of a cylindrical shell of a finite wall thickness having ends that are enclosed with head members that are bolted with bolt means into the wall thickness circumferentially around the shell to provide a fluid tight seal, and shaft means extending from each head member in axial alignment with said cylindrical shell to provide a rotatable can roll;

B. having associated internal heating means for heating the rolls with high pressure steam; the improvement which comprises providing head member insulating means operatively associated with at least one of the head members of A, said insulating means comprising;

(1) outer rim means having an inboard edge and an outboard edge of a diameter not exceeding the diameter of

the head member, said outer rim means having a substantial width and further having heat insulating material adjacent to an interior portion of the width;

(2) clip means affixed to the bolt means of A and further affixed to an inboard edge of the outer rim of (1) to hold the inboard edge of the outer rim in a sealing relationship with the head member;

(3) segmental face heat insulating means affixed to the outboard edge of the outer rim, said segmental face heat insulating means having heat insulating material adjacent to its inboard portion and being formed of at least two semicircular segments adapted to allow the shaft means to pass therethrough, said segments being held together in a sealing relationship with splice plate means; said outer rim means of (1) and its insulating material in conjunction with the segmental face heat insulating means of (3) and its insulating material defining an air space between the insulating materials of (1) and (3) and the associated head member;

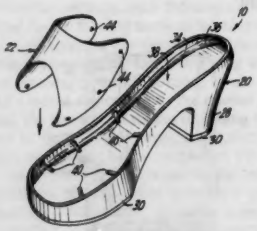
to provide a heated can roll of greatly improved thermal efficiency by reducing all forms of heat loss from the head member, including heat loss through natural convection, convection due to rotation, forced convection due to air draft, and radiation.

4,348,820

SHOE STRUCTURE

Antonio D'Alessio, 208 Bay 44th St., Brooklyn, N.Y. 11214

Filed Feb. 2, 1981, Ser. No. 230,443
Int. Cl.³ A43B *3/24, 3/12*
U.S. Cl. 36—101 **10 Claims**



1. A shoe structure comprising:

an elongated base member having a top surface which is circumscribed by an upstanding ridge, said top surface and said ridge cooperating to define a hollowed-out recess, said base member further including a plurality of locking pins projecting from said ridge towards the interior of said recess;

an elongated strap member having a plurality of pin receiving apertures located at the opposed ends thereof, said strap member being mounted to said base member with said pins of said base member being received in said apertures of said strap member; and

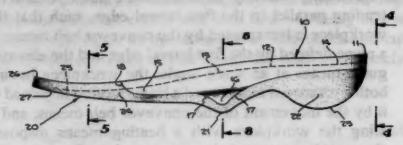
an insole member having a configuration substantially conforming to said hollowed-out recess and mounted therein, with the lower surface thereof being bonded to said top surface of said base member and with said locking pins and said opposed ends of said strap member being interposed between said inside and base members, whereby said base, strap and insole members form a sturdy integral shoe.

4,348,821

SHOE SOLE STRUCTURE

Alexander C. Daswick, 700 Orange Grove, Apt. 210, South Pasadena, Calif. 91030

Filed Jun. 2, 1980, Ser. No. 155,589
Int. Cl.³ A43B *13/12, 13/18, 5/06*
U.S. Cl. 36—103 **28 Claims**



1. In a running shoe, a sole structure adapted to support and protect the foot of the wearer while permitting movement at the metatarsal arch thereof, comprising:

means providing an elongated generally flat base extending from heel to toe, the portion of said base extending rearwardly of the metatarsal arch being substantially rigid, the portion of said base forward of the metatarsal arch being adapted to selectively bend upwardly relative to said rigid rear portion thereof;

resilient means carried underneath said base for cushioning the movements of the wearer's foot; and

pedestal means under the instep region of said base;

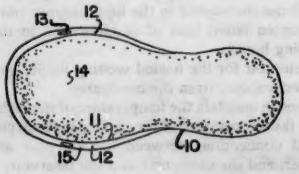
said pedestal means cooperating with said rigid rear portion of said base for supporting the entire weight of the wearer's body during horizontal transitional movement, and having a longitudinally curved under surface for imparting a rolling motion to the wearer's foot without any bending thereof.

4,348,822

SNOWSHOE FOOTWEAR

Stephen J. Lesavage, 150 Robindale Rd., Winnipeg, Manitoba, Canada R3R 1G7

Filed Dec. 31, 1980, Ser. No. 221,926
Claims priority, application Canada, Jan. 17, 1980, 344212
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—122 **7 Claims**



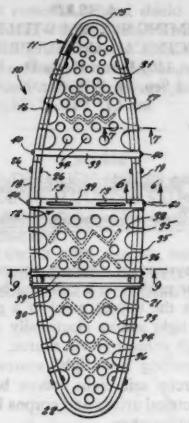
1. In a boot or shoe which includes a sole, for use with snowshoes, said snowshoes including detachable fastening means for securing the snowshoes to the boot or shoe; means on said boot or shoe to detachably retain the fastening means onto the sole of the boot or shoe, said means including a planar portion of the sole extending beyond the welt of the boot or shoe adjacent the fastening area and an elongated slot formed vertically through the planar portion to detachably receive and retain the fastening means in position relative to the boot or shoe.

4,348,823

SNOW LIFE SHOES

Frank H. Knapp, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jul. 24, 1980, Ser. No. 171,885
Int. Cl.³ A43B 5/04
U.S. Cl. 36—123 **2 Claims**



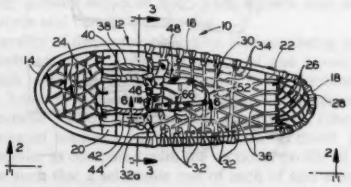
1. A pair of snow life shoes, each one of which comprises in combination a snowshoe including a foldable frame around a web, and a pair of shoe binding holders supported upon cross members of said frame, and said web including cleats on an underside thereof said cleats including means to tend said snowshoes to spread apart from each other, wherein said frame includes a plurality of tubes telescopically snap fitted together wherein an endless elastic cord extends through all said tubes for pulling them together under tension.

4,348,824

SNOWSHOE AND HARNESS ASSEMBLY

Buford W. Treadwell, 10301 E. Division St., Cadillac, Mich. 49601

Filed Jan. 19, 1981, Ser. No. 226,437
Int. Cl.³ A43B 5/04
U.S. Cl. 36—125 **8 Claims**



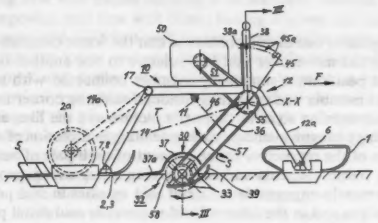
1. A harness for a snowshoe having toe chord means, comprising an elongated binding extending generally transversely of said snowshoe and being secured generally medially of opposite first and second ends to said toe chord means as to have said first and second ends movable with respect to said snowshoe, first and second toe strap means respectively secured to said first and second ends of said binding, a first strap fastener carried by said first strap means, third and fourth heel strap means respectively secured to said first and second ends of said binding, a second strap fastener carried by said third heel strap means, said first and second toe strap means being operative for drawing said first and second ends of said binding against opposite sides of a boot worn by a person walking on said snowshoe and said first fastener being effective to maintain said first and second ends tightly against said boot regardless of the size or configuration of said boot, said third and fourth heel strap means being operative for drawing and holding the toe portion of said boot within said tightly engaging first and second ends and said second fastener being effective to maintain said third and fourth heel strap means against the heel of said boot regardless of the size and configuration of said boot, said binding being formed of moisture impervious material which is flexible in one direction and substantially rigid in directions generally transverse to said one direction and which is substantially stable regardless of exposure to moisture and frigid temperatures.

4,348,825

TRACKING OR GRADING UNIT FOR SKI-TRAILS AND PATHS

Anton R. Bächler, Seeburgstrasse 10, 6006 Luzern, Switzerland

Filed Jul. 14, 1980, Ser. No. 168,132
Claims priority, application Austria, Jul. 13, 1979, 4882/79
Int. Cl.³ E01H 4/00; E01C 19/41
U.S. Cl. 37—222 **1 Claim**



1. An apparatus for grading ski trails or paths comprising at least one front support and at least one rear support, a frame for mounting said front and rear supports, said frame including a transverse pivotable tubular member, a pivot arm fixedly connected at one end thereof to said tubular member for joint rotation therewith, a cutting device for cutting the snow cover, said cutting device being attached to the other end of said pivot arm, rotary spring means for biasing said cutting device toward the snow cover, said rotary spring means including a torsion spring sleeve, one end portion of said torsion spring sleeve being fixedly connected with said tubular member, and adjusting means for adjustably connecting the opposite end portion of said spring sleeve with said frame to thereby adjust the force applied to said cutting device, said adjusting means including a locking disc attached to said frame and having a plurality of recesses around the outer periphery thereof, and a pivot lever fixedly secured to said other end of said torsion spring sleeve, said pivot lever including a pin which is adapted to engage any of said plurality of recesses in said disc to adjust the force applied to said cutting device.

4,348,826

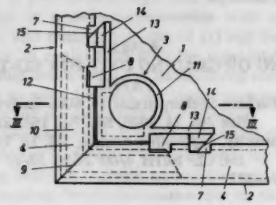
FRAME FOR PICTURES AND THE LIKE

Paul Reim, Rathausgasse 5, D 7100 Heilbronn, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,887
Claims priority, application Austria, Sep. 7, 1979, 5900/79
Int. Cl.³ A47G 1/06; G09F 1/12
U.S. Cl. 40—155 **11 Claims**

1. A frame for front insertion of pictures and the like, comprising a plurality of elongated frame elements which together bound an inner opening having corners, each of said frame elements having two end portions spaced from one another in direction of elongation and each having an inclined edge, said frame elements being movable relative to one another between

a proximal position in which the inclined edges of each pair of neighboring frame elements abut against one another and a distal position in which they are spaced from one another, each said end portion of each of said frame elements having two arresting recesses spaced from one another in direction of elongation of the respective frame element; means for holding a picture and the like in the frame and including engaging formations provided in said frame elements; and means for connecting said frame elements with one another, said connecting means comprising a plurality of connecting elements each including an angled member having two legs insertable into each pair of the neighboring frame elements outside of a



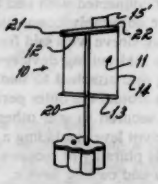
respective one of said corners so that the frame elements of said pair can move over said legs relative to one another between said positions, a supporting member connected with said angled member and extending inside of said one corner into said inner opening so as to support a picture and the like, and two springy tongue members each extending in direction of elongation of the respective frame element of each pair of neighboring frame elements and each having an arresting projection alternately engageable in one of said recesses in said proximal position and in the other of said recesses in said distal position so as to retain each pair of neighboring frame elements in a respective one of said positions.

4,348,827

DISPLAY DEVICE

Gerald W. Brinker, 8384 Squirrelridge Dr., Cincinnati, Ohio 45243

Filed Jun. 26, 1981, Ser. No. 277,723
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—607 **7 Claims**



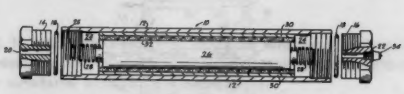
1. A display device for use in conjunction with a display of several types of similar articles comprising: a first sheet of material having front and back faces; first horizontal creases extending across the width of said sheet one each near the upper and lower ends thereof dividing said sheet into a first narrow upper support section and a lower narrow support section, and a large center display section the face of which is adapted to be imprinted with information concerning one of the several types of articles in the display, said creases being of a nature as to permit the front faces of said support sections to be folded toward the back face of said center display section so as to be positioned at approximately 90° to the front face of the latter; an aperture at approximately the center of each support section for receiving means for supporting said first sheet in a vertical position; at least one slit in said sheet, and a second smaller sheet of material having front and back faces, the front face of said second sheet being imprinted with information concerning a second one of the several types of articles, said second sheet having a tab extending through said slit for securing said second sheet to said first sheet.

4,348,828

LASER-AIMING SYSTEM WITH MEANS FOR ELECTRICAL ARC SUPPRESSION

Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77077

Filed Sep. 24, 1979, Ser. No. 77,990
Int. Cl.³ F41G *1/34*
U.S. Cl. 42—1 A **33 Claims**



1. An aiming system for weapons comprising:

a light source for projecting a coherent beam of light onto a target to mark the impact point of a projectile from said weapon, said light source electrically operated by a high frequency, high voltage power source;

a member supporting said light source attached to said weapon, whereby said light source being susceptible of producing electrical arcing and corona between said power supply and said member;

an electrical arc suppressor disposed between said member and said light source for eliminating electrical arc and corona between said member and said power supply; and

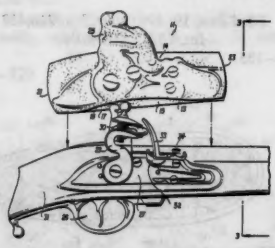
a buffer disposed within said member for absorbing shock to said light source upon recoil of said weapon.

4,348,829

WEATHER SHIELD FOR THE FIRING MECHANISM OF A GUN AND ITS METHOD OF MANUFACTURE

Lewis R. Bosco, P.O. Box 189, East Berlin, Pa. 17316, and Richard J. Bosco, Hampton Ct., Butler, Pa. 16001

Filed Feb. 22, 1980, Ser. No. 123,943
Int. Cl.³ F41C *27/08*
U.S. Cl. 42—1 N **5 Claims**



1. A removable weather shield for protecting exterior ignition elements forming a firing mechanism of a firearm, said ignition elements including a hammer, a flint clamp, a strike plate, a charge pan and a port adjacent said charge pan and communicating with an interior bore of said firearm, said weather shield comprising:

a one-piece resilient shield body having a linear extent exceeding the linear extent of said exterior ignition elements of said firearm and a generally C-shaped cross sectional shape formed by a generally curved continuous top and integrally connected depending side walls, said shield body having an interior profile substantially conforming to an exterior profile of a portion of said firearm contain-

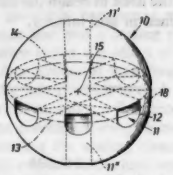
ing said ignition elements and providing a friction fit between the interior of said body and an exterior portion of said firearm including said ignition elements, the sidewalls of said body being separated by a widthwise interior space which has a dimension slightly less than the widthwise dimension of said firearm portion and being slightly deformable against a natural bias of said body to permit expansion of said widthwise dimension for aiding in mounting and removal of said shield to and from said firearm, said shield, when mounted on said firearm, covering and protecting said ignition elements from the environment, said natural bias causing said sidewalls to press against the sides of said firearm portion when said body is mounted in place.

4,348,830

BODY HAVING THROUGH HOLES AND A METHOD FOR MANUFACTURING SAID BODY

Carl E. Hagberg, Stockholm, Sweden, assignor to Intermatch S.A., Nyon, Switzerland

Filed Oct. 2, 1978, Ser. No. 948,042
Claims priority, application Sweden, Oct. 17, 1977, 116549
Int. Cl.³ A63H *33/10, 33/04;* B25G *3/28, 3/00*
U.S. Cl. 46—26 **25 Claims**



1. A kit for building toy-like configurations having at least one selectable geometrical shape, said kit comprising:

(a) a plurality of blocks having exterior surfaces, each of said exterior surfaces having at least an extreme outer surface portion, a central inner region circumscribed by said extreme outer surface portion; at least one aperture on the extreme outer exterior surface of each of said blocks, said at least one aperture defining a hole, said hole having a substantially central longitudinal axis extending from substantially adjacent said outer surface generally toward said central inner region, said hole having a progressive variation in cross-sectional area along said longitudinal axis, the variation resulting in the cross-sectional area being greater adjacent said outer surface and smaller towards said central region; and

(b) plurality of disposable elongated elements being formed of substantially a deformable material and having ends which have a cross section adapted to be insertable into the holes in said blocks at least for interconnecting a selectable portion of said blocks one with the other, said elongated elements having ends with sectional profile dissimilar as compared with the sectional profile of a said hole such that a selectable end of each of said elongated elements in assembly is compressibly grippable by material deformation in and by its corresponding hole at one of at least several locations along said portion of decreasing cross-sectional area of the hole, said blocks each having a first part and a second part; said first part having a first contacting surface for making contact with said second part; said second part having a second contacting surface for making contact with said first contacting surface; said first contacting surface being substantially smooth; said second contacting surface having at least one groove therein, said at least one hole being formed in assembly by said groove of said second surface and a portion of said first surface adjacent said at least one groove.

4,348,831

DEVICE TO ASSIST GROWTH OF TOMATO PLANTS AND METHOD OF USING THE SAME

Michael Chambers, 6704 North Star Rd., Ferndale, Wash. 98248

Filed Sep. 29, 1980, Ser. No. 191,391
Int. Cl.³ A01G *13/10*
U.S. Cl. 47—32 **21 Claims**

1. A device to assist the growth of a plant, such as a tomato plant which has a root portion, a stalk portion and an upper growth portion, said device being adapted to be positioned at a ground location and comprising:

(a) an inner tubular portion comprising a vertically extending first wall means defining a substantially vertical passageway, said first wall means having a lower end and an upper end, said first wall means adapted to be positioned with the lower end at a lower ground location and the upper end further above the ground location, with the vertical passageway permitting growth of the stalk portion of the plant upwardly therethrough and being of a height sufficient to surround at least a substantial part of said stalk portion,

(b) an outer support portion comprising:

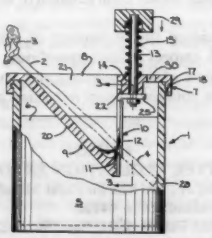
1. a downwardly and outwardly sloping second wall means surrounding and spaced radially outwardly from the first wall means, and having an upper inner edge portion adjacent to the upper end of the first wall means, in a manner that said upper growth portion is permitted to grow downwardly over said second wall means,
2. a lower trough means extending around and connected to the second wall means to support the upper growth portion,
3. an upwardly turned outer rim means connected to and surrounding the trough means.

4,348,832

SINGLE FLOWER STEM CUTTER

Allan H. Hauser, 15295 Westover Rd., Elm Grove, Wis. 53122

Filed Oct. 27, 1981, Ser. No. 315,499
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—1 R **11 Claims**



1. A flower stem cutter, comprising a hand portable container for confining a bath of liquid sufficient to cover the lower end of a flower stem beyond a severing location, a support blade located within said container below the water

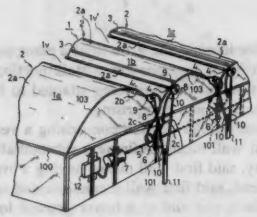
level, means for locating a flower stem resting on said support blade and extending laterally and upwardly of the support blade, a guillotine blade in the plane immediately adjacent the plane of said support blade, and means for relatively moving of said blades to move pass each other blade and thereby sever a flower stem supported therebetween.

4,348,833

OPENING AND CLOSING A FLEXIBLE SCREEN IN A GREENHOUSE OR THE LIKE

Takato Nagoya, Oyama, Japan, assignor to Seiwa Kagaku Kabushiki Kaisha, Japan

Filed Feb. 18, 1981, Ser. No. 235,637
Int. Cl.³ A01G *9/14*
U.S. Cl. 47—17 **10 Claims**



1. In apparatus for opening and closing a flexible screen of a greenhouse or the like of the type wherein a rotatable winding rod is fixed by one end edge of the flexible screen and wherein the screen is opened or closed by rotating the winding rod in a normal or reverse direction, respectively, the improvement comprising:

an elongated driving shaft rotatably mounted about a fixed axis of rotation;

drive means for selectively rotating said driving shaft in either one of the normal and reverse directions;

transmission gear means operatively connected to said driving shaft;

an elongated flexible driving shaft operatively connected at one end to said transmission gear means and adapted to be rotated through said transmission gear means upon the rotation of said driving shaft;

reduction gear means operatively connected to the other end of said elongated flexible driving shaft, said reduction gear means being mounted for movement with respect to said greenhouse;

a winding rod operatively connected at one end to said reduction gear means and which is fixed to one end edge of the flexible screen adapted to be rotated through said reduction gear means upon rotation of said flexible driving shaft; and

means for guiding the movement of said reduction gear means with respect to said greenhouse according to the rotary motion of said winding rod and for preventing spontaneous rotation of said reduction gear means.

4,348,834

VINE-TYPE VEGETATION ERADICATOR

Robert P. Martin, Jr., c/o Martin Sheet Metal, Inc., 7108 Madison Ave., Cleveland, Ohio 44102

Filed Feb. 9, 1981, Ser. No. 232,635
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **7 Claims**

1. A device for eradicating vine-type vegetation comprising a liquidtight, substantially closed container having an interior for holding a liquid herbicide and receiving the natural or cut end of the stem or stalk of undesirable vegetation, a herbicide in the container, the container having an open neck leading to the interior of the container for receiving the stem end, and

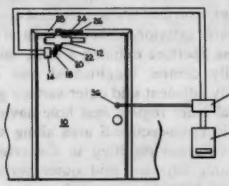
means adjacent the neck to retain the stem immersed in a liquid herbicide contained in said interior.

4,348,835

AUTOMATIC DOOR OPENING DEVICE

Stanley Jones, 1918 Lake St., Holland, Mich. 49423, and Willard Nyenbrink, 6549 Fillmore St., Allendale, Mich. 49401

Filed Dec. 31, 1979, Ser. No. 108,676
Int. Cl.³ E05F *15/00*
U.S. Cl. 49—139 **17 Claims**



1. An auxiliary power-assisted door opening device for use in connection with a door closing mechanism that includes a pair of pivotally connected arms extending between a door and a door jamb and rotation control means connected to at least one of the arms for urging the arms to pivot so as to close the door at a controlled rate of speed, wherein the auxiliary door opening device comprises:

electromechanical drive means adapted to be mounted on the door or door jamb adjacent the rotation control means for positively pivoting the arms of the door closing mechanism so as to open the door when the drive means is activated, said electromechanical drive means comprising an electrical motor having a rotatable output shaft and a gear mechanism operably coupling the rotation control means to the output shaft of the motor, such that rotation of the output shaft causes the gear mechanism to mechanically drive the rotation control means to open the door; and

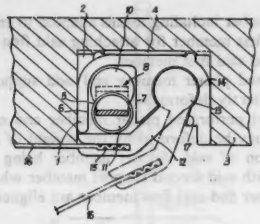
selective activation means for activating the drive means to automatically open the door.

4,348,836

AUTOMATIC BASE SEAL

Claude G. Dumenil, and Louis P. Dumenil, both of 4075, Route de Neufchatel, 76230 Bois-Guillaume, France

Filed May 13, 1980, Ser. No. 149,489
Claims priority, application France, May 16, 1979, 79 12424
Int. Cl.³ E06B 7/20
U.S. Cl. 49—311 6 Claims



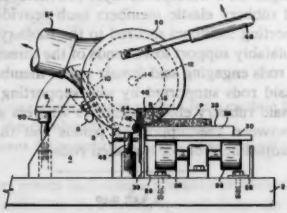
1. Automatic base seal constituted of a profile molding to be attached to a panel, particularly a door, pivoting in a door frame, within an elongated rectangular channel formed in a bottom edge of the panel, said base seal comprising an elongated sealing means pivotable between a retracted position with respect to the base seal and a sealing position extended with respect to the latter under the effect of an actuating device, said profile molding having at least two internal longitudinal grooves in side by side relation to each other and within the confines of the profile molding, a first groove receiving the actuating device of the pivoting sealing element, and a second groove pivotally mounting the sealing element which, in its retracted position with respect to the base seal, extends generally across the first groove, said actuating device in the first groove being operable in response to closing the panel to be at least partially extended downwardly from said first groove to engage and pivot the sealing element to its sealing position, said profile molding comprising an inverted U-shaped section permitting it to be positioned in and attached to the inside of the rectangular channel formed in the bottom edge of the panel, and wherein the sealing element pivoting in the profile molding has at its extremity a flexible sealing lip made in the form of a strip having a cross section between 1 and 9 tenths of a mm.

4,348,837

METHOD AND APPARATUS FOR BEVELING THE FRONT END OF A FELT PAD

David R. Crooks, Medina, Ohio, assignor to Hapad, Inc., Bethel Park, Pa.

Filed Jul. 7, 1980, Ser. No. 166,137
Int. Cl.³ B24B 9/00, 9/02; C14B 1/14
U.S. Cl. 51—5 R 9 Claims



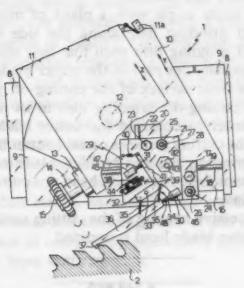
1. Apparatus for beveling the front end of a felt workpiece having a substantially straight front edge which includes a housing, a motor mounted on said housing, a shaft rotated by said motor, a wire wheel brush mounted on said shaft for rotation therewith, a shroud surrounding said brush, means for applying a suction to said shroud, said brush having a cylindrical portion on the side adjacent said motor and a tapered portion on the side opposite said motor extending away from said cylindrical portion toward said shaft, a blade mounted on said shaft adjacent the cylindrical portion of said brush for rotation therewith, a shearplate mounted on said housing adjacent said blade and having a cutting surface for substantially contacting the face of said blade, at least one of said blade and shear plate having an abrasive surface, a table mounted on said housing for supporting the bottom of said workpiece with its front end facing said wire wheel and substantially parallel to the axis thereof, and a table support, said table being movable on said table support substantially parallel to the axis of said brush from a loading position with the workpiece on the side of said brush remote from said motor to a position on the opposite side of said brush whereby the front end of said workpiece is beveled.

4,348,838

BROACH SHARPENING MACHINE

Elio Tacchella, Acqui Terme, Italy, assignor to Tacchella Macchine S.p.A., Alessandria, Italy

Filed Nov. 13, 1980, Ser. No. 206,398
Int. Cl.³ B24B 19/00
U.S. Cl. 51—34 C 8 Claims

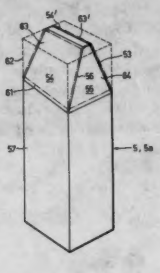


1. A broach sharpening machine, of the type comprising a first sharpening slide arranged to impart, to a grinding wheel supported by it, a movement having a constant stroke away from and towards said broach in a direction transverse to the longitudinal axis of the broach, a second and a third slide mobile along two axes which form a contained angle, the axis of movement of said second slide being parallel to said longitudinal axis, and a feeler unit arranged to determine the position of said grinding wheel relative to each tooth of said broach in succession, characterised in that said third slide supports both said feeler unit and said first slide, and that said feeler unit comprises an articulated parallelogram constituted by a frame rotatable relative to said third slide about an axis perpendicular to the broach axis and to the axis of movement of said second slide, a drag link, and two resilient cranks which connect said drag link and said frame together; the feeler unit also comprising first means for detecting the movements of said frame about its axis of rotation, and second means for detecting the axial movement of said drag link, this latter comprising coupling means arranged to engage with the teeth of said broach positively and in succession, resilient means being connected to said frame in order to move said coupling means towards said broach teeth.

4,348,839
METHOD FOR PRODUCING SURFACES AT A BLADE CUTTER HEAD FORMED OF HARDENED CUTTER BLADE STEEL

Erhard Konersmann, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle, Zurich, Switzerland

Filed Dec. 26, 1979, Ser. No. 107,133
Claims priority, application Switzerland, Jan. 9, 1979, 152/79
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—281 R 4 Claims



1. A method of producing cutting surfaces on a cutter blade head of a cutter blade, formed of hardened steel, for use in a cutter head assembly of a gear cutting machine, comprising the steps of:

producing blade surfaces of a pre-profile of the cutter blade head by means of a cutting-off grinding disk having a front surface and a side surface;

forming an acute angle with a plane of movement of the cutting-off grinding disk along the side surface of the cutting-off grinding disk such that said side surface does not substantially cut part of the cutter blade head already cut by the front surface of the cutting-off grinding disk;

moving the cutting-off grinding disk in its plane of movement in order to confront the cutter blade head and to produce the cutting surfaces on said cutter blade head; and

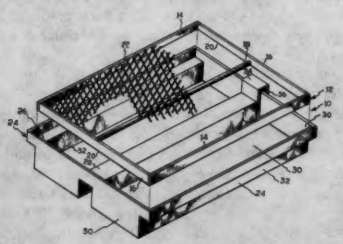
thereafter grinding the pre-profiled blade surfaces of the pre-profile of the cutter blade head at a cutter blade grinding machine;

whereby excessive heating of the cutting surfaces produced on the cutter blade head is avoided.

4,348,840
MODULAR HAZARDOUS DUST COLLECTION PAN AND WALKWAY

Charles J. Strader, Perrysburgh, and Richard V. Walle, Toledo, both of Ohio, assignors to Eltra Corporation, Toledo, Ohio

Filed May 22, 1980, Ser. No. 152,454
Int. Cl.³ E04F *19/10*
U.S. Cl. 52—180 6 Claims



1. A dust collection and walkway device, comprising:

a first generally pan-shaped member;

a cover member forming a frame and adapted to cooperate with said first member and be supported upon said first member;

said cover member including a perforated planar member attached to said frame;

said frame including a support member;

said first member including a second support member adapted to be in alignment with said support member when said first member and said cover member are aligned;

said first member including means adapted to engage a second said first member for attaching said first member to said second said first member;

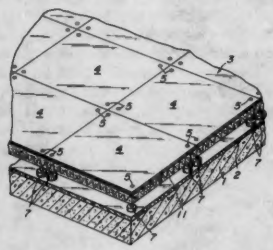
said perforated planar member and said support member being resiliently deformable,

whereby said perforated planar member and said support member may be deformed by the weight of a user, said deformation of said support member being limited by contact with said second support member when said second member and said first member are aligned.

4,348,841
OUTER HEAT INSULATING STRUCTURE ON A BUILDING ROOF

Kazunori Ueno, Higashimurayama, and Toru Kobayashi, Kodaira, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed May 13, 1980, Ser. No. 149,594
Claims priority, application Japan, May 18, 1979, 54-61763; Aug. 28, 1979, 54-117386[U]
Int. Cl.³ E04D *15/00*
U.S. Cl. 52—126.5 4 Claims



1. An outer heat insulating structure on a building roof comprising; a plurality of covering layer panels formed by superposing concrete slabs on supporting panels made of a heat insulating material and adjacently arranged with one another and provided with through-apertures, female screw members secured to the supporting panels to be in alignment with said through-apertures, threaded rods capable of being threadedly engaged with the female screw members, rubbery elastic members arranged on a waterproof layer provided on the building roof, said rubbery elastic members each provided with aperture supporting members secured to the rubbery elastic members to rotatably support lower ends of the threaded rods, said threaded rods engaging said female screw members and lower ends of said rods supported by said supporting members secured in said rubbery elastic members wherein an air space is formed between the supporting panels and the waterproof layer by adjustment of the threaded rods.

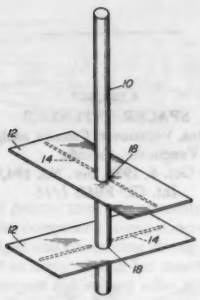
4,348,842
LOCKING POST

Henry L. Wilkinson, 210 W. Latimer, Tulsa, Okla. 74106

Filed Jul. 11, 1980, Ser. No. 167,648
Int. Cl.³ E02D *5/74*
U.S. Cl. 52—166 1 Claim

1. A locking post comprising an elongated cylindrical verti-

cal post having a pair of vertically spaced and horizontally extending holes located above but adjacent to the bottom of the post, said holes being oriented in directions at right angles to each other, a pair of spaced horizontal flat rectangular plates mounted on the posts above the holes and extending in a generally right angular relationship with respect to each other, and



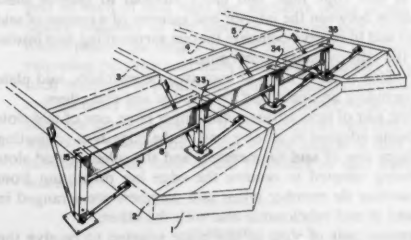
a horizontal rod passing through each hole immediately below each plate to maintain the plates in position on the posts, whereby the assembly can be placed in a suitable hole in the ground with the plates below the surface of the ground and whereby the suitable hole can be filled in with dirt to cover both plates.

4,348,843

MOBILE HOME SUPPORT SYSTEM

Neil S. Cairns, 31361 McWade St., Homeland, Calif. 92348, and Loyd Hendershott, 215 N. "A" St., Perris, Calif. 92370

Filed Aug. 4, 1980, Ser. No. 174,752
Int. Cl.³ E04H *9/02*
U.S. Cl. 52—167 **2 Claims**



1. An earthquake protection system for a mobile home having a frame, the combination comprising:

support means for supporting said mobile home frame on the ground,

said support means including a plurality of telescoping stanchions carried on an I-beam, spaced along the bottom of said mobile home and support on the ground,

each of said stanchions comprising an outer telescoping section, support arms and a base, and

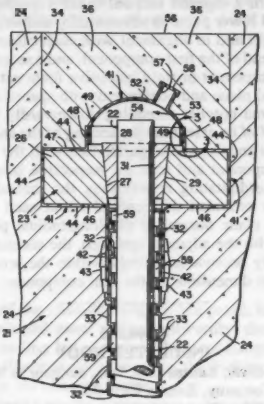
each bottom of said support arms rotatably connected to the inner telescoping section of said stanchion and the tops of said support arms secured to the mobile home frame.

4,348,844

ELECTRICALLY ISOLATED REINFORCING TENDON ASSEMBLY AND METHOD

Morris Schupack, 37 Splitrock Rd., South Norwalk, Conn. 06854, and Mario G. Suarez, 117 Sutton Manor, New Rochelle, N.Y. 10905

Filed Sep. 25, 1980, Ser. No. 190,178
Int. Cl.³ E04C *3/10, 5/08*
U.S. Cl. 52—230 **17 Claims**



1. A reinforcing tendon assembly for use in a concrete structure or the like, said assembly including a pair of tendon anchorages mounted in relatively spaced-apart relation in said structure, an elongated reinforcing tendon extending between and anchored by said anchorages, and electrically insulating conduit means mounted on said tendon and extending between said anchorages, wherein the improvement in said tendon assembly is comprised of:

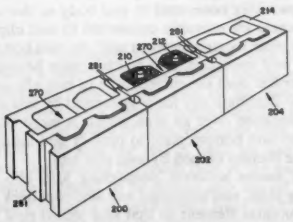
an electrically insulating anchorage envelope means mounted at each of said anchorages in sealed relation to said conduit means, said anchorage envelope means extending around and encasing each of said anchorages and said tendon to completely electrically isolate said tendon assembly from said structure.

4,348,845

THERMALLY INSULATED MASONRY BLOCK

Anthony N. Iannarelli, 345 N. Washington St., Belchertown, Mass. 01007

Filed Jun. 2, 1980, Ser. No. 156,048
Int. Cl.³ E04B *2/00*
U.S. Cl. 52—405 **2 Claims**



1. A two-part composite insulated building block the parts of which may be assembled into a unitary configuration at the construction site or elsewhere and comprising: a first part in the form of a component of cementitious material of generally

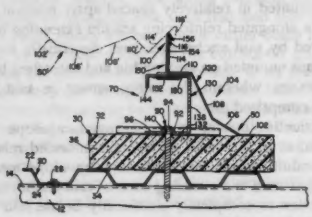
rectangular configuration and extending from a lower horizontal plane to an upper horizontal plane and further extending between opposite end planes and first having spaced outer and opposite side walls extending vertically between the said horizontal planes, a transverse central web interconnecting the said side walls centrally thereof and a pair of transverse end webs interconnecting the said side walls outboard of the central web and inboard of each respective end plane with the adjacent webs defining therebetween a of open ended air cells extending between the upper and lower planes, the webs each being provided with a tapered thermal break extending upwardly from the said lower plane to substantially midway of the vertical web height and in alignment with each other transversely from end to end of the first component, and a second part in the form of a component of rigid insulative foam extending along a longitudinal plane and configured with spaced strategically-located tapered notches extending downwardly through substantially half of its extent for the seating of the second component between and in general parallelism with the side walls of the first component and into the respective tapered thermal breaks in interdigitating relationship, the second component being further provided with an end tab at each terminus extending in a plane normal to the longitudinal plane for embracement with the adjacent end web, the second component being nestably receivable entirely within the area defined by the outermost dimensions of the first component.

4,348,846

INSULATED ROOF

Norman A. Bellem, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Oct. 2, 1980, Ser. No. 193,003
Int. Cl.³ E04B 1/76
U.S. Cl. 52—410 **14 Claims**



1. A building roof comprising:

a corrugated roof deck securely mounted on structural elements of a building;

a layer of rigid insulation on said roof deck layer;

a plurality of roof panels on said insulation and joined together by a joint which does not penetrate said roof panels;

a clip unit which includes a body, a bottom plate and a hook means joined to said roof panel joint, said hook means being movably connected to said body so that said joined roof panels are movably connected to said clip unit;

a bearing plate located between said clip unit bottom and the top of said insulation, said bearing plate having a surface area greater than the surface area of said clip unit bottom plate to distribute any force generated by said clip unit on said insulation over an area which is large compared to said clip unit bottc m plate to protect said insulation from damage thereto caused by said clip unit;

fastening means securely connecting said clip unit, said bearing plate, said insulation and said roof deck to a building structural element so that said joined roof panels are movably mounted on the building structural element, said bearing plate permitting secure fastening of said clip units, said insulation and said roof deck to said structural elements without endangering said insulation;

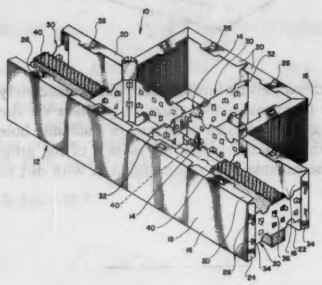
said roof deck accommodating horizontally directed loading on a building and said movably mounted roof panels accommodating expansion and/or contraction of said joined rood panels, by reason of said insulation being securely positioned on top of said roof deck said roof deck horizontal load accommodating capability is increased by said insulation and roof panels over such capability of a roof deck alone.

4,348,847

SPACER EXTENDER

Christopher E. Jukes, Vancouver, Canada, assignor to Mod-Lok Industries Ltd., Vancouver, Canada

Filed Oct. 6, 1980, Ser. No. 194,007
Int. Cl.³ E04B 1/16
U.S. Cl. 52—426 **8 Claims**



1. A spacer extender adapted to be used with a consumable modular predetermined dimensional building block to effectively increase the normal lateral dimension of said block when forming a frame for a pilaster along a wall formed of a plurality of said blocks, wherein said block includes a pair of side plates and a pair of identical transverse tie members at each end of said plates, opposed edge lugs projecting from said tie members to unite with said plates to create a block of rectangular configuration and strength lugs projecting in the same direction as said edge lugs, said block adapted to receive sheet insulation between the interior and exterior of a course of said blocks and to receive concrete therein surrounding said insulation, the improvement comprising,

a locking plate to unite at least two tie members, said plate including an upper and lower edge and end edges;

a first pair of slots adjacent said upper edge, one of said slots being adapted to receive one of the edge lugs projecting from one of said tie members and the other of said slots being adapted to receive the edge lug projecting from another tie member when said members are arranged in end to end relationship one with the other;

a second pair of slots in said plate adapted to receive the strength lug from one of said tie members and the other of said second slot adapted to receive the strength lug from said another tie member to increase stability;

said lugs being pliable whereby they may be distorted to permanently affix said locking plate and at least a pair of said tie members together; and

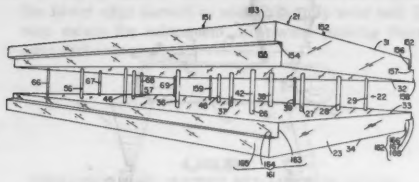
said other of said opposed edge lug of one of said united tie members united with one of said side plates and the opposed edge lug of another of said united tie members united with another of said side plates, whereby said side plates are in parallel relationship but of a width greater than the normal predetermined dimensional building block.

4,348,848

SEGREGATED SLAB STRUCTURAL PRODUCTS

Walter L. Denzer, P.O. Box 12013, Lubbock, Tex. 79452

Filed Apr. 1, 1980, Ser. No. 136,383
Int. Cl.³ E04B *1/02*
U.S. Cl. 52—432 **6 Claims**



1. A structural precast structure assembly product comprising a first rigid slab comprising strong concrete and reinforcing steel, a second rigid slab comprising strong concrete and reinforcing steel and an array of steel bar members therebetween;

said first and second slab spaced away from each other, the first slab extending between a first plane and a second plane, said first and second planes parallel to each other, and the space between said first and second planes occupied by a rigid material comprising concrete and steel,

the second slab extending between a third plane and a fourth plane and said third and fourth planes parallel to each other and spaced away from each other and the space between said third and fourth planes occupied by a rigid material comprising concrete and reinforcing steel;

said first and fourth planes spaced apart from each other and parallel to each other, said second and third planes located between said first and fourth planes, said second plane located between said third and first planes, said third plane located between said second and fourth planes;

said second and third planes spaced apart from each other by an interslab spaced, rigid steel bar members extending from said material between said third and fourth planes to the material between said first and second planes, each of said steel bar members having one part thereof located between said second and third planes and directly exposed to the interslab space, and another part of each of those steel bar members being firmly and rigidly attached to the material between said first and second planes and another part of each of said steel bar members being firmly and rigidly attached to the material between said third and fourth planes, the length of each of said steel bar members extending between said slabs located in a parallel array of such members in parallel flat planes, said slabs connected to each other only by said steel bar members whereby the slabs are movable relative to each other in two directions transverse to each other and to the length of said steel members to the limit of the flexibility of said steel bar members.

4,348,849

STARTER STRIP FOR HORIZONTAL SIDING PANELS

Carl A. Wollam, Cortland, and Lynn Gailey, Newton Falls, both of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

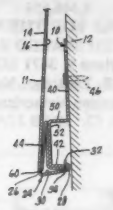
Filed Aug. 11, 1980, Ser. No. 177,091
Int. Cl.³ E04D *1/34*
U.S. Cl. 52—545 **6 Claims**

1. For use with a wall-mounted array of overlapping parallel courses of horizontally elongated siding panels mounted one above another on a wall, each of said panels having outwardly and inwardly facing major surfaces, a top margin securable to the wall, and a bottom margin bent inwardly and upwardly to form an inwardly projecting, upwardly opening longitudinal channel flange with an upstanding inner leg, a starter strip for anchoring the bottom margin of at least one panel of the lowermost of the courses to the wall, said starter strip comprising:

(a) a leg mountable on the wall;

(b) a locking flange connected to the starter strip leg, positioned and dimensioned to be received in the channel flange of said one panel and having an inner dge, spaced from the starter strip leg, for bearing against the upstanding leg of the channel flange; and

(c) resilient biasing means, receivable with the locking flange in the panel channel flange and disposed to act against the inwardly-facing surface of said one panel adjacent the



bottom of the channel flange of the panel, for urging the last-mentioned panel surface outwardly, thereby to hold the upstanding leg of the panel chanel flange against said locking flange inner edge when the locking flange is received in the channel flange;

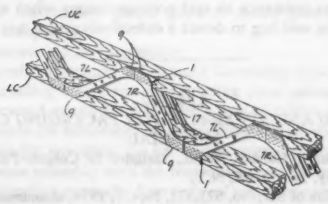
(c) said biasing means comprising a depending spring leg having a free, outwardly projecting lower end for engaging the aforesaid inwardly-facing panel surface, said lower end of said spring leg being so disposed that said spring leg is compressed inwardly by the panel when said spring leg and said locking flange are received in the panel channel flange.

4,348,850

WEB MEMBER

Milton E. Reeder, Ballwin, and Walter G. Moehlenpah, Ladue, both of Mo., assignors to Moehlenpah Industries, Inc., St. Louis, Mo.

Filed Aug. 6, 1979, Ser. No. 63,791
Int. Cl.³ E04C *3/02*
U.S. Cl. 52—693 **23 Claims**



1. A relatively flat sheet metal structural web member for interconnecting a pair of generally parallel spaced-apart wood chord members to form a floor truss or the like, said web member being generally V-shaped, comprising first and second legs integrally joined at one of their respective ends, a plurality of teeth struck from said one end of each leg and extending from one face, constituting the inside face, of the web member, said teeth being adapted to be driven into one of the chord members, and a plurality of teeth struck from the other end of each leg and extending from the inside face of the web member, said teeth being adapted to be driven into the other of said chord members, each tooth being relatively wide in relation to its thickness, thereby having opposed relatively wide surfaces, the teeth struck from opposite ends of the first leg being oriented to present said surfaces generally broadside within the

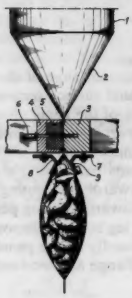
range of 45°–90° with respect to the central longitudinal plane of the first leg or a plane parallel thereto, and the teeth struck from opposite ends of the second leg being oriented to present said surfaces generally broadside within the range of 45°–90° with respect to the central longitudinal plane of the second leg or a plane parallel thereto, the resistance of the teeth to movement through the wood of the chord members thereby being maximized so as to increase the load-holding capacity of the web member.

4,348,851

PACKING MACHINE FOR THE PRODUCTION OF FILLED SEALED BAGS

Bouwe Prakken, Spijkerlaan 9, 3471 EG Kamerik, Netherlands

Filed Jul. 3, 1980, Ser. No. 165,617
Claims priority, application Netherlands, Jul. 5, 1979, 795262
Int. Cl.³ B65B *57/08*
U.S. Cl. 53—75 **5 Claims**



1. A packing machine for packaging a product in bags of sealable material, comprising a fill pipe, means for forming a tube of sealable material surrounding said pipe, sealing jaws for forming end seals on said tube thereby forming a sealed bag, and detecting means for detecting leaks in said bags, said detecting means including pressure means for exerting pressure on a bag after it has been sealed by said sealing jaws, said detecting means also including a switch operable in response to little or no resistance to said pressure means when exerting pressure on said bag to detect a defectively sealed bag.

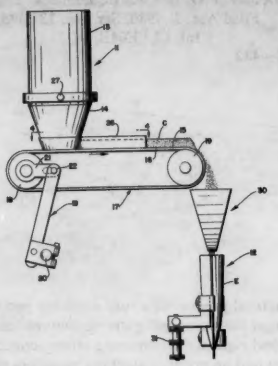
4,348,852

METHOD AND APPARATUS FOR PACKAGING LOOSE MATERIAL

David Clancy, Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 521,771, Nov. 7, 1974, abandoned. This application Oct. 6, 1977, Ser. No. 840,093
Int. Cl.³ B65B *1/04*
U.S. Cl. 53—469 **14 Claims**

1. A method of automatically packaging relatively loose particulate material in substantially uniform volumetric amounts in a series of receptacles such as envelopes comprising the steps of providing a supported generally horizontal column of said material of substantially uniform lateral cross section, intermittently advancing said column longitudinally in equal increments of advance spaced by dwell periods toward an envelope filling station while positioning in predetermined succession a series of spaced open-top envelopes to be filled at said station in stationary condition and in such sequential timed relation that during each advance a leading section of predetermined volume falls from the end of said column into an envelope being maintained in position at said station, and after each envelope has received its predetermined volume of material



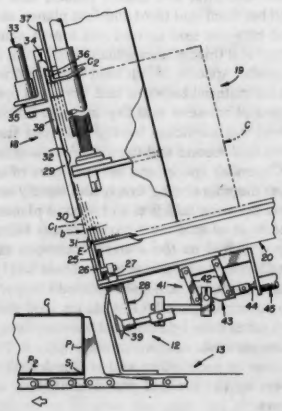
from said column moving that envelope to a station wherein the top thereof is closed.

4,348,853

CASE OPENING AND SEALING APPARATUS

Hugh B. Morse, 1840 Campbell Ave., San Jose, Calif. 95125, and Helmut E. Masch, 764 Asbury St., San Jose, Calif. 95126

Filed Aug. 8, 1980, Ser. No. 176,507
Int. Cl.³ B65B *7/20, 43/30*
U.S. Cl. 53—566 **10 Claims**



1. In a case opening and sealing apparatus comprising a magazine having a plurality of flattened case blanks stacked in upstanding relationship therein, a conveyor underlying said magazine, and opening means for opening said case blanks, the improvement comprising

shuttle means for sequentially (1) engaging a lower edge of a leading one of said case blanks to prevent removal thereof from said magazine, (2) moving said case blank upwardly to release the lower edge thereof from said magazine, and (3) pushing said case blank downwardly onto said conveyor, said shuttle means including a fixed first stop means secured at a forward end of said magazine for engaging a lower end of said case blank, and a fixed second stop means having a lower end disposed vertically above and closely adjacent to said first stop means for defining an opening therebetween for permitting down-

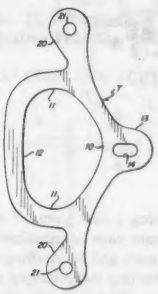
ward movement of said case blank therethrough when said blank is pushed downwardly onto said conveyor, a rearward side of said second stop means engaging upper portions of said case blank being disposed forwardly in offset relationship relative to a rearward side of said first stop means engaging the lower end of said case blank whereby upward movement of said case blank will permit the lower edge thereof to snap forwardly over said first stop means for subsequent downward pushing thereof onto said conveyor.

4,348,854

TIEDOWN AND INSTEP STRAPS FOR SPURS

Pershing R. Van Scoyk, 7193 W. 32nd Ave., Wheatridge, Colo. 80033, and Charles L. Welton, Rte. 1, Box 505 V, Golden, Colo. 80401

Filed Apr. 17, 1981, Ser. No. 255,232
Int. Cl.³ A43C *17/00*
U.S. Cl. 54—83 R **11 Claims**



1. A tiedown strap for a spur having a band, a shank extending rearwardly from said band and a rowel mounted on said shank, said band having arms extending forwardly alongside a counter of a boot having a sole and a heel below said counter, said tiedown strap comprising:

a body having a rear extension detachably connectable to the rear of said spur;

a front loop stretchable onto the front of said boot heel; and

means at each side detachably connectable to the respective arms of said spur.

4,348,855

CROP DAMAGE RESPONSIVE CONTROL OF ROTOR SPEED

Richard A. DePauw, East Moline, and Richard W. Staiert, Geneseo, both of Ill., assignors to International Harvester Company, Chicago, Ill.

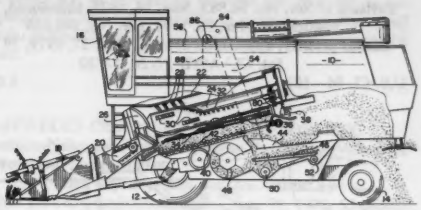
Filed Sep. 22, 1980, Ser. No. 189,238
Int. Cl.³ A01F *12/00*
U.S. Cl. 56—10.2 **15 Claims**

1. In a crop harvesting combine comprising:

a variable speed crop threshing mechanism for separating grain from the crop material;

means for determining the ratio of damaged to undamaged grain received from said threshing mechanism;

and control means for varying the speed of said threshing mechanism in response to changes effected in said ratio by said determining means, whereby the threshing mechanism is automatically speed-adjusted to maximum effective speed without exceeding a selected amount of damage to the grain in the threshing process.

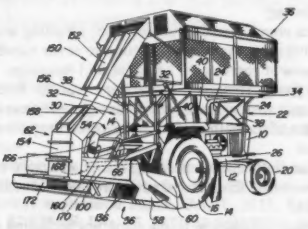


4,348,856

TRACTOR MOUNTED COTTON HARVESTER

Russell D. Copley, Ankeny, and Francis E. Schlueter, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 26, 1981, Ser. No. 266,876
Int. Cl.³ H01D *46/08*
U.S. Cl. 56—30 **44 Claims**



1. A cotton harvester adapted for forward movement over a field of transversely spaced rows of cotton plants, the harvester comprising:

a transverse frame assembly;

a plurality of transversely spaced harvesting units, each unit including a fore-and-aft extending plant passage with a forward mouth for receiving a row of cotton plants and means for removing the cotton from the plants;

means for mounting the harvesting units on the transverse frame assembly with the respective plant passage mouths extending generally forwardly of said frame assembly;

a mobile power unit including a fore-and-aft extending body and front and rear wheels supporting the body for forward movement through the field, said wheels being transversely spaced to run between rows of cotton plants;

a cotton basket supported on and above the power unit;

means for supporting the transverse frame assembly from the mobile body substantially rearwardly of the rear wheels with the plant passage mouths of the mounted units located adjacent a transverse upright plane intersecting the rearmost extremeties of the rear wheel, wherein a substantial portion of the plant passage extends rearwardly of the upright plane; and

cotton conveying means extending upwardly from the harvesting units to the cotton basket for conveying the removed cotton to the basket.

4,348,857

ROTARY MOWER CONDITIONER

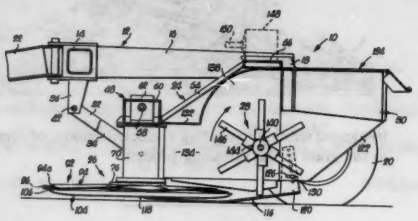
Marc A. Berlivet, and Abel A. J. Guerineau, both of Coex, France, assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 94,883, Nov. 16, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 248,859

Claims priority, application France, Mar. 27, 1979, 79 07657

Int. Cl.³ A01D *57/26, 57/30*

U.S. Cl. 56—192 **4 Claims**



1. In a mobile crop-harvesting machine:

front frame structure including a front, transverse beam and at least a pair of upright, stationary housings depending from said front beam at spaced locations along the latter;

an upright, rotatable drive shaft contained within each of said housings, respectively;

a mowing rotor attached to the lower end of each of said shafts, respectively and projecting radially outwardly from below the lower termination of the corresponding housing;

means coupled with said shafts for effecting said rotation to drive said rotors in a direction to sever standing crop and throw it rearwardly between said housings;

rear frame structure spaced rearwardly from said front frame structure including upright portions on opposite sides of the path of travel of severed crop from said rotors; and

fore-and-aft, interconnecting frame structure extending between said front frame structure and said rear frame structure,

said interconnecting frame structure including a pair of side members affixed to respective ones of said housings at least adjacent said lower terminations thereof above said rotors and extending rearwardly therefrom along opposite sides of said path of travel of the severed crop to said upright portions,

each of said side members comprising a panel connected to and extending along substantially the full upright length of its corresponding housing at the front end of the panel and connected to and extending along substantially the full upright length of its corresponding upright portion at the rear end of the panel.

4,348,858

METHOD OF AND APPARATUS FOR MAKING A DOUBLED YARN

Johann Rottmayr, Reutlingen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 262,930

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018551

Int. Cl.³ D02G *3/36, 3/38;* **D01H** *11/00*

U.S. Cl. 57—18 **18 Claims**

1. A method of making a doubled yarn comprising the steps of:

drawing a core yarn off a core-yarn supply and pulling said core yarn longitudinally in a travel direction along a yarn path;

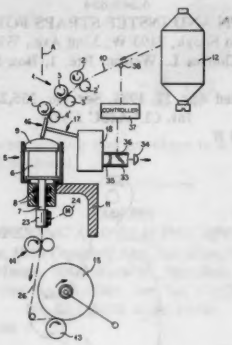
drafting said core yarn longitudinally at a drafting station along said path;

winding a winder yarn around said core yarn at a winding location downstream of said drafting station and thereby doubling said core yarn;

passing a current of air longitudinally in said direction along said core yarn along an upstream section of said path downstream of said station and upstream of said winding location; and

passing a current of air longitudinally opposite to said direction along said core yarn along a downstream section of said path immediately downstream of air upstream section and immediately upstream of said winding location.

2. An apparatus for making a doubled yarn, said apparatus comprising:



means for drawing a core yarn off a core-yarn supply, for pulling said core yarn longitudinally in a travel direction along a yarn path, and for drafting said core yarn longitudinally at a drafting station along said path;

a tube extending along and surrounding said path downstream of said drafting station and having relative to said direction an upstream portion and a downstream portion;

means for passing a current of air longitudinally in said direction along said core yarn in said upstream portion and for passing a current of air longitudinally opposite to said direction along said core yarn in said downstream portion; and

means for winding a winder yarn around said core yarn at a winding location immediately downstream of said tube.

4,348,859

METHOD AND APPARATUS FOR THE PRODUCTION OF FANCY YARN

Per O. Olsson, Bruksgatan, S-312 02 Laholm, Sweden

PCT No. PCT/SE79/00002, § 371 Date Sep. 5, 1979, § 102(e) Date Sep. 5, 1979, PCT Pub. No. WO79/00489, PCT Pub. Date Jul. 26, 1979

PCT Filed Jan. 9, 1979, Ser. No. 143,584

Claims priority, application Sweden, Jan. 10, 1978, 7800246

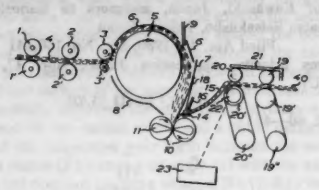
Int. Cl.³ D01H *1/12*

U.S. Cl. 57—401 **10 Claims**

1. Method of producing fancy yarn, in which method basic yarn material is formed to basic yarn twist in the nip between rotating spinning cylinders, the nip being subjected to a partial vacuum, and fancy material pieces being introduced into the nip in order to be included in the basic yarn twist, wherein the fancy material pieces, within the region of said partial vacuum, are flung against a screen for further conveyance to the nip.

6. Apparatus for producing fancy yarn comprising two spinning cylinders positioned together with a nip therebetween for yarn spinning, means for causing a partial vacuum in the nip

between the cylinders, means for supplying basic yarn material to the nip, a screen in the proximity of the nip, a source of gas



under pressure, and means for flinging, with the assistance of gas under pressure, fancy material pieces against the screen.

4,348,860

SPINNING OR TWISTING MACHINE

Max Hartmannsgruber, Kirchheim, Fed. Rep. of Germany, assignor to Firma Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

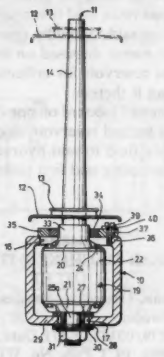
PCT No. PCT/EP79/00082, § 371 Date Jun. 21, 1980, § 102(e) Date Jan. 28, 1980, PCT Pub. No. WO80/00853, PCT Pub. Date May 1, 1980

PCT Filed Oct. 22, 1979, Ser. No. 195,017

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845933

Int. Cl.³ D01H *7/10, 1/244*

U.S. Cl. 57—100 7 Claims



1. A spinning or twisting machine comprising:

a spindle rail having a linear axis, said spindle rail including an upper opening and a lower opening coaxial with the linear axis,

a textile spindle disposed in an upright position on said spindle rail,

a rotatable shaft cooperating with the textile spindle,

an electromotor disposed within said spindle rail and having a rotor shaft driven by the electromotor, said rotor shaft being connected with said rotatable shaft to drive said textile spindle,

an upper bearing bracket and a lower bearing bracket of the electromotor disposed on said spindle rail,

said upper bracket being connected to said spindle rail by at least one elastic member,

said lower bearing bracket including a dependent rigid tang,

said rigid tang extending into a cup that protrudes through said lower opening in said spindle rail and is radially adjustable relative to said lower opening,

an elastomeric holder ring interposed between said lower bearing bracket and said cup,

a damping means including oil as a damping medium disposed in said cup for reducing oscillations of said electromotor and said spindle shaft,

a ring disposed on a ring rail with the spindle passing coaxially through the ring,

said upper and lower bearing brackets are disposed on the spindle rail and are adjustable in position radially on all sides independently of one another relative to said spindle rail.

4,348,861

JEWELRY CHAINS BY ELECTRO-FORMING

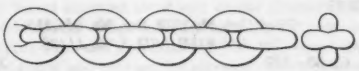
Shigesaburo Nakagawa, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 79,996

Claims priority, application Japan, Mar. 29, 1978, 53-36385; Mar. 31, 1978, 53-37935; May 18, 1979, 54-66678

Int. Cl.³ A44C *11/00*

U.S. Cl. 59—82 7 Claims



1. A jewelry chain thickened by electroforming wherein a jewelry chain as an original material is smoothly thickened by electroforming in a bath containing copper sulphate and sulfuric acid at a temperature of about 30° C. to obtain a fattened chain link thereof such that a distance between interlinked pivotting points of each chain links of said chain becomes smaller in relation to thickness of said chain link thus produced to make the chain in a denser construction.

4,348,862

EXHAUST SYSTEM FOR A TWO-CYCLE ENGINE

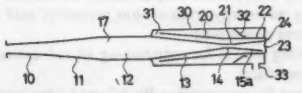
Tetsuzo Fujikawa, Kawogawa, and Shinichi Tamba, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 921,679, Jul. 3, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,644

Claims priority, application Japan, Jul. 1, 1977, 52-79381; Oct. 27, 1977, 52-129468; Dec. 15, 1977, 52-169138[U]; Dec. 16, 1977, 52-170307[U]

Int. Cl.³ F01N *1/08;* F02B *27/02*

U.S. Cl. 60—314 1 Claim



1. In an exhaust system for a two-cycle engine and of the type having a first expansion chamber including an exhaust gas inlet opening and a diverging pipe portion which decreases the gas pressure in the inlet opening, and including a rear cone-shaped converging portion which increases the gas pressure, the improvement comprising:

a second expansion chamber having a discharge end open to the atmosphere and an inlet end for receiving the exhaust gas from said first expansion chamber so as to decrease the gas pressure; said second expansion chamber comprising:

an outwardly tapered pipe portion;

a constant diameter portion surrounding said tapered pipe portion and closed by an undulated reflector plate spaced from the outlet of said tapered pipe portion;

an outwardly flared expansion portion connected to the open end of said constant diameter portion and extending back toward said first expansion chamber;

a hollow cylindrical housing enclosing said rear cone-shaped portion, said outwardly tapered pipe portion, said constant diameter portion, and said outwardly flared expansion portion; and

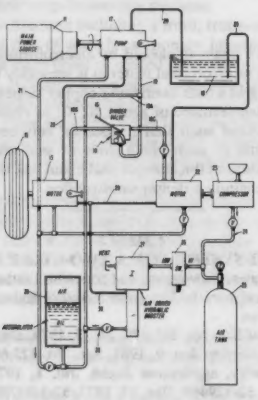
annular divider means disposed in said cylindrical housing and defining a muffling chamber, said chamber being open to the atmosphere.

4,348,863

REGENERATIVE ENERGY TRANSFER SYSTEM

Heyward T. Taylor, 1604 Evers Dr., McLean, Va. 22101, and Michael B. Lambert, 5018 King David Blvd., Annandale, Va. 22003

Filed Oct. 31, 1978, Ser. No. 956,316
Int. Cl.³ F15B *1/02, 3/00, 11/08*
U.S. Cl. 60—327 **23 Claims**



1. In a system having a power source driving a mechanical output means through an energy transmission system, a compressed fluid system for storing kinetic energy not used in driving the mechanical output means connected to a power source by an energy transmission assembly, said compressed fluid system comprising:

(a) storing means for maintaining stored amounts of compressed fluid,

(b) means for compressing fluid from a continuous supply of fluid for said storing means,

(c) drive means for operating said fluid compressing means to direct fluid from said continuous supply to said storing means, and

(d) diverting means connected between said transmission assembly and said drive means for directing the amount of said kinetic energy proportionally not used in driving said mechanical output means away from said transmission assembly to said drive means,

(e) said drive means being effective to produce a stored amount of compressed fluid from said continuous supply by operating said fluid compressing means,

(f) said stored amount being directly related to said proportionally directed amount of kinetic energy,

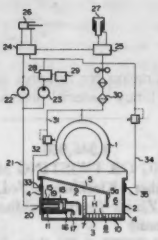
(g) means connected to said energy transmission assembly to recapture kinetic energy on demand from the stored amounts of compressed fluid produced by said diverted unused kinetic energy for driving said mechanical output means.

4,348,864

TANK ASSEMBLY FOR HYDRAULIC SYSTEM

Masaaki Ichimura; Yasumasa Tarumizu, and Kiyouzi Uranaka, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 140,441
Claims priority, application Japan, Apr. 17, 1979, 54-50095[U]
Int. Cl.³ B01D *35/06*
U.S. Cl. 60—454 **10 Claims**



5. A tank assembly for a hydraulic system including a hydraulic load device, a transmission, a first pump for said hydraulic load device and a second pump for said transmission, said tank assembly comprising:

a tank having a bottom and side walls;

a partition wall for dividing the inside of said tank into a first and a second reservoirs, said first reservoir being adapted to receive fluid from said hydraulic system;

dust collector mat means disposed on the bottom wall of said tank in said first reservoir for collecting dust from drained fluid and keeping it therein;

strainer means mounted inboard on one of the side walls of said tank within said second reservoir, said strainer means being adapted to supply fluid to said hydraulic system; and

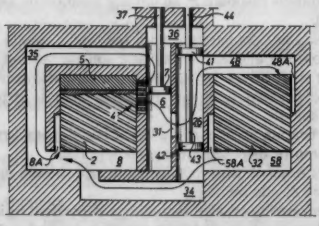
means for communicating said first reservoir with said second reservoir.

4,348,865

HELICAL GEAR MACHINE WITH REGULATED OUTLET

Berth U. Gustafsson, Österskär, Sweden, assignor to AB Bonnierföretagen, Sweden

PCT No. PCT/SE79/00181, § 371 Date May 2, 1980, § 102(e) Date May 2, 1980, PCT Pub. No. WO80/00591, PCT Pub. Date Apr. 3, 1980
PCT Filed Sep. 6, 1979, Ser. No. 194,296
Claims priority, application Sweden, Sep. 6, 1978, 7809392
Int. Cl.³ F16D *31/04;* F04B *49/02;* F01C *1/16;* F04C *18/16*
U.S. Cl. 60—493 **7 Claims**



1. A gear machine comprising two helical gears having a plurality of teeth and running in mesh with each other, a first sealing body arranged against one end surface of the gear pair, and fluid port in the first sealing body, a second sealing body

arranged against outside circles of the gears at one meshing zone, tooth profiles of the two gears are alike with each tooth profile including a flank which continuously merges into a rounded top and a rounded bottom, the tops of the teeth of one of the gears being adapted for sealing against the bottoms of the teeth of the other gear in a plane through the axes of the gears, the port includes a plurality of holes at one end opening out at said end surface of the gear pair in a zone comprising an area substantially including the union of the surfaces which are each defined by the outside circle and a circle defined by the bottoms of the respective gear teeth between the axes plane and a gear radius (R) forming an angle (α) with the axes plane, said angle (α) does not exceed a value of $B\times(1/R)\times$tangent β, where B is the width of the gear pair, R is the outside circle radius of the respective gear and β is the helix angle of the gears, the plurality of holes at their other ends opening out in a duct at axially separated places in the duct in the same order as the holes open out at said one end to said end surface in the direction of rotation of the gears, a sealing piston displaceably arranged in the duct, one end of the duct communicates with a fluid outlet of the machine, and means for displacing the piston in the duct to enable the machine to be regulated at a constant rate of revolutions.

4,348,866

MASTER CYLINDER

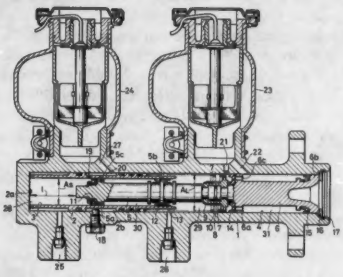
Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Continuation of Ser. No. 828,844, Aug. 29, 1977, abandoned. This application Mar. 4, 1980, Ser. No. 127,062

Claims priority, application Japan, Sep. 4, 1976, 51-106061; Sep. 4, 1976, 51-106062

Int. Cl.³ B60T *11/06*

U.S. Cl. 60—561 **1 Claim**



1. A tandem-type master cylinder for a vehicular brake comprising:

a cylinder body having extending therethrough a uniform inner diameter bore having a first closed end and a second open end;

a sleeve slidably received within said bore, said sleeve defining therein a small diameter cylinder portion;

a plurality of axially spaced flanges provided on the outer surface of said sleeve;

a piston assembly including a smaller diameter piston slidably received within said cylinder portion of said sleeve and a larger diameter piston slidably received within said bore of said cylinder body, said smaller and larger diameter pistons being rigidly connected;

stop means within said bore adjacent said second end thereof for preventing said piston assembly from removal from said bore;

a single spring positioned between said sleeve and said piston assembly and normally biasing a first end of said sleeve into contact with said closed first end of said bore and normally biasing said piston assembly against said stop means;

a first oil pressure chamber defined between said smaller diameter piston and said closed first end of said bore within said bore, said first oil pressure chamber adapted to be connected to a first brake system;

a second oil pressure chamber defined between said smaller and larger diameter pistons within said bore, said second oil pressure chamber adapted to be connected to a second brake system;

a relief port extending radially through said sleeve;

a supply port extending radially through said sleeve at a position axially spaced from said relief port;

axially spaced first and second annular flanges provided on the outer surface of said smaller diameter piston;

said first annular flange having axially extending therethrough at least one axially extending port;

a replenishment chamber defined between the inner surface of said sleeve, said first and second annular flanges and the outer surface of said smaller diameter piston;

an oil reservoir communicating with said replenishment chamber through said supply port;

cup seal means mounted about said smaller diameter piston at said first annular flange for blocking said relief port and said axial port when said piston assembly moves toward said first closed end of said bore and for allowing oil to pass from said replenishment chamber through said axial port into said first oil pressure chamber when said piston assembly moves in a return direction toward said second open end of said bore;

whereby, upon movement of said piston assembly toward said first closed end of said bore during normal operation, oil pressures within said first and second oil pressure chambers will be increased and transmitted to the first and second brake systems;

whereby, upon movement of said piston assembly in said return direction toward said second open end of said bore during normal operation, said sleeve is moved toward said larger diameter piston against the force of said single spring solely in response to a difference in the oil pressures due to a difference in amounts of oil remaining in said first and second oil pressure chambers, and any excess oil within said first oil pressure chamber will escape therefrom by passing outwardly through said relief port; and

stopping means, extending through said cylinder body into said bore at a position between certain of said axially spaced flanges of said sleeve, for limiting the extent of axial movement of said sleeve in a direction toward said second open end of said bore.

4,348,867

METHOD FOR TREATING MOIST PULVERULENT MATERIAL

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

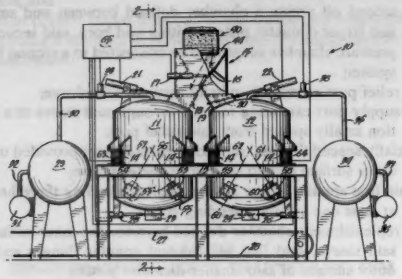
Division of Ser. No. 63,577, Aug. 3, 1979, Pat. No. 4,252,001, which is a continuation-in-part of Ser. No. 918,515, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 780,670, Mar. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 761,414, Jan. 27, 1977, abandoned. This application Oct. 20, 1980, Ser. No. 198,462

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—64 **4 Claims**

1. The method for cooling foundry sand which comprises, determining the Btu content of hot foundry sand, adding water to the hot sand at a ratio of approximately one pound of water for each 1100 Btu content of the sand, introducing the moistened sand into a container, applying a vacuum to the container

to evaporate the water from the sand, vibrating the container and sand while under vacuum, removing and condensing the



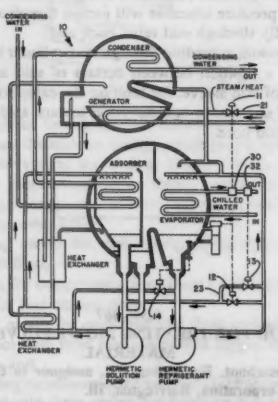
water vapor produced by said evaporation and removing the cooled sand from the container.

4,348,868

AUTOMATIC DILUTION CONTROL FOR ABSORPTION REFRIGERATION

Glenn B. Foster, Baldwinsville, N.Y., and John E. Post, Cincinnati, Ohio, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,860
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—101 4 Claims



1. A method for operating an absorption refrigeration system wherein the generator provides the cooling load for a process while the system continues to supply chilled water including the steps of:

supplying heated gases from a process to the generator of an absorption refrigeration system to drive off refrigerant from the absorbent-refrigerant solution and be cooled thereby; and

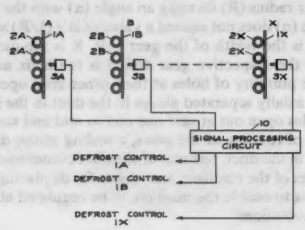
adding refrigerant to the absorbent-refrigerant solution in response to the temperature of the chilled water whereby the system is responsive to the heat supplied to the generator rather than the cooling demand.

4,348,869

MEANS FOR DETECTING THE ACCUMULATION OF FROST IN A LOW TEMPERATURE REFRIGERATION SYSTEM

Frank Massa, Cohasset, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees

Filed Sep. 2, 1980, Ser. No. 183,231
Int. Cl.³ F25D *21/02*
U.S. Cl. 62—140 4 Claims



1. Means for detecting the accumulation of a layer of frost of a specified thickness on a sub-freezing surface of a refrigeration system, said detection means includes an electroacoustic transducer, said transducer characterized in that it includes a vibratile element that can be operated at a resonant frequency mode, mounting means for holding said electroacoustic transducer with its vibratile element in close proximity to the sub-freezing surface on which the layer of frost is to be detected, an oscillator circuit, said oscillator circuit characterized in that its frequency of oscillation is controlled by the resonant frequency of said vibratile element, said vibratile element further characterized in that a vibrating portion of said vibratile element includes a projecting probe-like tip portion which is located at a fixed distance from said sub-freezing surface, said fixed distance is determined by the specified thickness layer of accumulated frost which is to be detected, said oscillator circuit further characterized in that the circuit stops oscillating when the frost layer accumulates to a thickness sufficient to reach said projecting probe-like tip portion of said vibratile element and prevents the continued resonant frequency mode of vibration of said vibratile element, detection circuit means connected to the output of said oscillator circuit for detecting the presence of said oscillator signal, said detection circuit means characterized in that the stopping of the oscillation of said oscillator circuit is recognized by said detector, the recognition by said detector of said change in state of said oscillator circuit output signal indicates that the frost layer thickness has accumulated to said specified thickness.

4,348,870

TEMPERATURE PROBE FOR AIR CONDITIONING DEVICE

John C. Stein, and Donald W. Hutchison, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

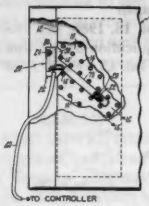
Filed May 1, 1981, Ser. No. 259,341
Int. Cl.³ F25D *21/02*
U.S. Cl. 62—140 17 Claims

1. A temperature probe for use with an air conditioning device of the type including a heat exchanger tube array comprised of a plurality of tube runs, said probe comprising:

a substantially rigid support member having an elongated portion, said elongated portion being slidably insertable into and out of said tube array externally of the respective tube runs;

temperature sensing means mounted to said elongated portion of said support member for insertion therewith into

said tube array to provide a signal representative of the temperature thereat; and



means for transmitting the temperature signal of said sensing means to a use location.

4,348,871

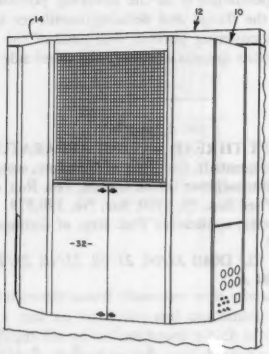
TRANSPORT REFRIGERATION MACHINE

Joel W. Androff, Rowland Heights, Calif., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 24, 1981, Ser. No. 238,389

Int. Cl.³ F25D *23/12*

U.S. Cl. 62—239 **4 Claims**



1. A transport refrigeration machine for conditioning the interior of a trailer, comprising:

a refrigerant compressor;

a condenser assembly including a condenser fan;

an evaporator assembly located rearward of the condenser assembly and including an evaporator fan;

shaft means for driving the condenser and evaporator fans;

power means for driving the compressor and the shaft means;

a frame supporting the refrigeration machine and for connecting the machine to the trailer, and including

a box sub-frame including a pair of vertically extending outside back beams, a pair of vertically extending outside front posts located forward of the back beams, horizontally extending top and bottom back beams extending between the outside back beams, and horizontally extending top and bottom front beams extending between the outside front posts,

a condenser assembly support sub-frame supported by and extending between the outside front posts of the box sub-frame and supporting the condenser assembly,

an evaporator assembly support sub-frame supported by the box sub-frame and supporting the evaporator assembly, and

a shaft support sub-frame secured to the condenser assembly support sub-frame, projecting rearward therefrom, and rotatably supporting the shaft means rearward of the condenser assembly and forward of the evaporator assembly.

4,348,872

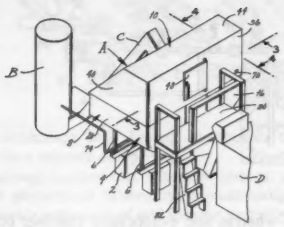
BULK ICE BIN

Kenneth W. Hill, R.R. 5, Mexico, Mo. 65265

Filed Jan. 19, 1981, Ser. No. 226,193

Int. Cl.³ F25C *5/18*

U.S. Cl. 62—459 **6 Claims**



1. An apparatus for storing ice cubes, said apparatus comprising: a housing having a lower section and an upper section supported on the lower section, the lower section having a generally planar and vertical front wall provided with an opening that is located midway between its sides and along its bottom, the lower section also having a pair of side walls and a bottom wall all of which slope downwardly toward the opening in the front wall, so that ice which is directed into the lower section will gravitate toward the opening, the upper section having a generally planar and vertical front wall that aligns with and forms an upward continuation of the front wall on the lower section, the front wall of the upper section also having an opening that is located generally above the opening in the front wall of the lower section, the upper section also having side walls that extend upwardly from the side walls of the lower section, and a planar back wall that extends upwardly from the back of the lower section, with the back wall being inclined such that the top of the upper section is considerably smaller than the bottom of the upper section, the inclined back wall having an opening near its upper end, whereby an inclined conveyor may be placed over the inclined back wall to bring its discharge end into close proximity and alignment with the opening in the back wall; a lower door supported on the front wall of the lower section and normally closing the opening in that front wall; an upper door supported on the front wall of the upper section and normally closing the opening in that wall; and means attached to the lower section for supporting it in an upright position.

4,348,873

APPARATUS FOR REFRIGERATION TREATMENT

Toshima Yamauchi, Oita; Sadao Nogami, Heppu; Kengi Sawada, Oita; Jyunichiro Moriya, Kokubunji; Hiroomi Sawada, Ichikawa, and Keizou Kobayashi, Hanno, all of Japan, assignors to Kabushiki Kaisha Kurio-Medikaru, Tokyo, Japan

Division of Ser. No. 109,271, Jan. 3, 1980, Pat. No. 4,292,973.

This application Jun. 23, 1981, Ser. No. 276,647

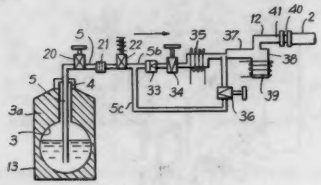
Claims priority, application Japan, Sep. 25, 1977, 52-114967; Aug. 28, 1978, 53-22900

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 R **5 Claims**

1. An apparatus for refrigeration treatment comprising a liquefied gas source, an evaporator for evaporating the liquefied gas at an optimum temperature, an exhaust tube connected between said gas source and said evaporator to conduct the liquefied gas from said gas source to said evaporator, a conduit for introducing the gas vaporized by said evaporator and being connected to said evaporator by means of an outflow port, and

a cup provided with a non-return expansion valve attached at the end of said conduit, said cup adapted to apply said vaporized gas to an affected portion of a patient in order to refrigerate said portion with said vaporized gas, said evaporator being provided with an evaporator chamber in which said liquid is accommodated and then evaporated by heat conduction from the wall surface thereof for evaporating the liquefied gas to a gaseous state to be blown out from the cup at a specified temperature and wherein said evaporating chamber comprises a float which floats on the surface of the liquid in the chamber in the area under the outflow port to the conduit and which blocks the outflow port when the liquid surface rises, said exhaust tube being opened below said outflow port, and being provided with a check valve between the evaporating chamber and the source which blocks the liquid from flowing back upstream toward the source.



4,348,874

MULTIPLE SPLINE HUB, PARTICULARLY FOR A TELESCOPIC SHAFT

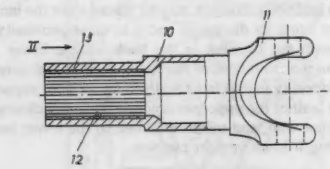
Helmut Müller, and Heinz Schweizer, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith Transmit GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,473

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917391

Int. Cl.³ F16C *1/00*

U.S. Cl. 464—162 **8 Claims**



1. A multiple-spline hub for a telescopic shaft for transmitting torque, the hub comprising:

a thin-walled circular-cylindrical tube section, developed as a toothed profile tube having teeth which extend linearly and parallel to the axis of the telescopic shaft; the teeth being adapted over their entire length for transmission of torque and the teeth being shaped for permitting displacement of the profile tube over a cooperating spline shaft;

a second tube which is thick-walled; a connecting element of the telescopic shaft being connected to the second tube for moving therewith; the second tube having a bore with an inner surface, and the second tube bore being sized so that the inner surface of the bore engages the teeth of the profile tube; the toothed profile tube being inserted over substantially its entire length in the bore of the second tube and the profile tube being connected with the second tube bore inner surface.

4,348,875

CLOSURE MEMBER FOR AN AUTOMOTIVE DRIVE SHAFT ASSEMBLY

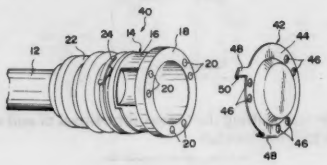
Mario Tsuru, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 18, 1980, Ser. No. 160,713

Claims priority, application Japan, Jun. 23, 1979, 54-86230

Int. Cl.³ F16C *1/06*

U.S. Cl. 464—170 **4 Claims**



1. In an automotive drive shaft assembly having a joint housing with a flanged, open end, a closure member for closing the open end, being of unitary construction and comprising a covering portion extending over the open end and engaging the outer side face of the flange, the periphery of the closure member being formed with a plurality of arms extending substantially perpendicularly to the covering portion along the periphery of the flange and defining cantilever springs supported by the covering portion, free ends of the arms being inturned to define detents engaging the inner side face of the flange.

4,348,876

WEFT THREAD LAYING APPARATUS

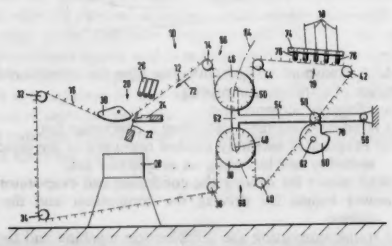
Josef Roth, Seligenstadt, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinen fabrik GmbH, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,579

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938860

Int. Cl.³ D04B *23/06, 23/08, 23/10, 23/12*

U.S. Cl. 66—84 A **15 Claims**



1. A weft thread laying apparatus for warp knitting

(a) a pair of endless transfer chain means generally disposed perpendicular to the needle bed of said warp knitting machine and proximate the ends thereof for continually carrying weft threads from a pick-up area to a delivery area proximate said needle bed, said transfer chains being provided with a plurality of holding elements disposed thereon;

(b) carriage means disposed above said pair of transfer chain means in said pick-up area, movable back and forth perpendicular to said transfer chain means;

(c) a plurality of thread guide means disposed upon said carriage means for laying a plurality of weft threads about said holding elements disposed on one of said pair of transfer chain means and then about the holding elements

disposed on the other of said pair of transfer chain means in a continuing sequence; and

(d) means for periodically additionally moving each said transfer chain means relative to said thread guide means when said carriage means is proximate each said transfer chain means for permitting said weft threads to lay around said holding elements on said transfer chain means.

4,348,877

AUTOMATIC TOWEL DISPENSER

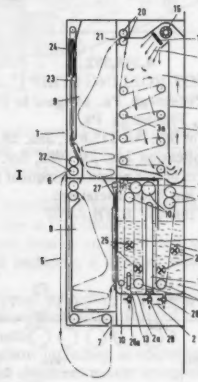
Hugo W. Geschka, Düsseldorf, and Bernd Beitecke, Dortmund, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 50,642, Jun. 21, 1979, abandoned. This application Feb. 25, 1981, Ser. No. 237,943

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827183

Int. Cl.³ A47K *10/30*

U.S. Cl. 68—13 R **8 Claims**



1. In an automatic towel dispenser with a housing having a delivery slot and an inlet slot and containing washing and drying chambers for an endless towel which is movable therethrough and has a cleaned section available for use and extending from the housing between the delivery and inlet slots, means defining a path for travel of the towel from the inlet slot to the washing chamber and from the drying chamber to the delivery slot, a first supply chamber provided in the housing and arranged to variably store a plurality of looped soiled towel sections between the inlet slot and the washing chamber, as viewed in the direction of movement of the towel, a second supply chamber provided in the housing and arranged to variably store a plurality of looped cleaned towel sections between the drying chamber and the delivery slot, as viewed in said direction, the path of movement of the towel including a portion along which the soiled towel sections advance through the washing and drying chambers to be respectively washed and dried, at least one wash tub and at least one rinsing tub in the washing chamber, means for advancing the towel through the tubs in the form or loops, water feed and water discharge valves connected to the washing chamber, and means for respectively operating the water feed and water discharge valves at the start and on completion of a washing cycle, the improvement which consists in the provision of a device for flushing residues out of the washing chamber including means for flooding the wash tub and the towel disposed therein, means for draining liquid from the wash tub, and means for first actuating said flooding means and for thereupon actuating said draining means during intervals between successive washing cycles.

4,348,878

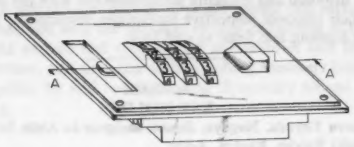
LOCKS OF SUITCASES WITH CHANGEABLE COMBINATIONS

Orson Chang, 476-478 Fu Hsin N. Rd., Taipei, Taiwan

Filed Feb. 22, 1980, Ser. No. 123,709

Int. Cl.³ E05B *37/02, 65/48*

U.S. Cl. 70—5 **4 Claims**



1. A combination lock having changeable combinations applicable to a suitcase comprising:

a case having an open top, a hollow interior, a plurality of paired protrusions bilaterally symmetrically located on both inside side walls of said interior partially partitioning said case into a plurality of interconnecting compartments, and a pair of end recesses at opposite ends of said interior;

a lid fitted to completely cover said open top having a plurality of slots therein;

a shaft extending from one of said recesses to the other;

a plurality of gate bodies in said case in a series parallel to each other, each one in one of said interconnecting compartments, each gate body having a hole therethrough through which said shaft extends, each said hole having a notch therein;

a plurality of warded bosses rotatably mounted on said shaft, each having a ward in a specified position on an inner margin and adapted to interact with one of said notches;

a plurality of annular dials mounted in a series parallel on said shaft, each dial having on its inner periphery corresponding cuts engageable with said wards;

a sliding sheet slidably retained between said lid and said case having a portion adapted to engage with a shackle on the suitcase and at least one claw extending interiorly of said case;

a switch engaged with said sliding sheet to move the same;

a stop piece housed in one of said recesses and engaged with one end of said shaft, said claw engaging said stop piece; and

a spring mounted on said shaft biasing said gate bodies, warded bosses and annular dials towards said stop piece, said spring being in the recess opposite the recess housing said stop piece.

4,348,879

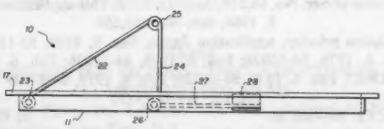
SECURITY DEVICE

Donald V. Knierim, 866 S. Cavalier Dr., Springfield, Mo. 65804

Filed Nov. 7, 1980, Ser. No. 204,794

Int. Cl.³ E05B *65/00;* E05C *17/44*

U.S. Cl. 70—93 **4 Claims**



1. A security device for limiting the amount of travel of a hinged swinging door comprising a housing which defines a trackway perpendicular to said door when it is closed, said housing being recessed in a floor proximate to said door so that the top portion of said housing is substantially flush with said floor, slots in said housing, lock means slideably disposed

within said housing oriented so that said lock means can engage and be retained by said slots, and linkage means connected to said lock means which define upstanding projections when said lock is engaged thereby providing a barrier that said door would abut against thereby thwarting an unauthorized entry through said door, and when said lock is disengaged and slid along said trackway said linkage means collapses into said housing, wherein said linkage means includes three arms serially disposed and hingedly interconnected with the outer arms at their opposite respective extremities respectively hinged to said housing and fixed to said lock.

4,348,880
KEY HOLDER

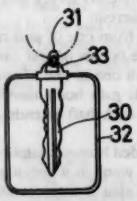
Minoru Toyoda, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 68,568, Aug. 22, 1979. This application Dec. 5, 1980, Ser. No. 213,354

Claims priority, application Japan, Sep. 8, 1978, 53-110845; Feb. 6, 1979, 54-13025; Feb. 6, 1979, 54-13026; Feb. 6, 1979, 54-13027; Feb. 6, 1979, 54-13028; Feb. 6, 1979, 54-13029

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—456 R **3 Claims**



1. A pendant type key holder comprising:
an elongated key extending in a first direction within a plane;
a support member secured to one end of said key;
a planar hollow elongated tubular body member freely rotatably supported by said support member for rotation about an axis lying within said plane and extending transverse to said first direction, a first portion of said body member adjacent said axis extending in the direction of said axis; and
connecting means for freely rotatably connecting said support member to a supporting body,
whereby gravity tends to cause said key and said body member to rotate into coincident vertical planes beneath said supporting body with said key lying framed within the hollow of said body member and wherein said key may be rotated about its longitudinal axis by applying rotational forces to said first portion of said body member.

4,348,881
KEY HOLDER

Minoru Toyoda, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

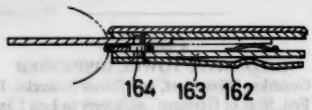
Division of Ser. No. 68,568, Aug. 22, 1979. This application Dec. 5, 1980, Ser. No. 213,358

Claims priority, application Japan, Sep. 8, 1978, 53-110845; Feb. 6, 1979, 54-13025; Feb. 6, 1979, 54-13026; Feb. 6, 1979, 54-13027; Feb. 6, 1979, 54-13028; Feb. 6, 1979, 54-13029

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—456 R **15 Claims**

1. A tie pin type key holder within which a tie can be inserted comprising:
a body having first and second elongated parallel spaced members;
a pin extending between said body members at one end of said body, for connecting said body members;
a key pivotably mounted by said pin between said members of said body at one end portion of said body and movable between an operating position in which the key is disposed outside said body and a non-operating position in which the key is housed between said members and within said body;
a resilient supporting member mounted by said pin at said end portion of only one of said body members and extending over only said one body member for guiding said tie upon insertion between said key holder and said guide member; and



biasing means positioned between said body members and having one end connected to one of said body members for maintaining said key at the non-operating position thereof.

4,348,882
HOT ROLLING STRIP

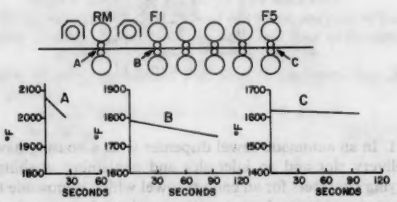
George W. Tippins, Pittsburgh, Pa., assignor to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 115,611, Jan. 28, 1980, Pat. No. 4,308,739. This application Jan. 23, 1981, Ser. No. 228,795

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.³ B21B *41/02*

U.S. Cl. 72—202 **9 Claims**



3. In the hot rolling of metal slabs to strip thickness, the steps comprising:
A. passing a heated metal slab into and through a roughing mill and reducing the said slab to a transfer bar on the order of one to three inches in thickness;
B. passing said transfer bar immediately to and between the work rolls of a reversing finishing mill stand and reducing it in thickness;
C. passing the workpiece immediately into a heated furnace on the downstream side of said reversing finishing mill stand and coiling it in said furnace;
D. discharging the workpiece from said downstream heated furnace and passing it back through and further reducing the workpiece in said reversing finishing mill stand;
E. immediately passing the workpiece into and coiling it in the heated furnace on the upstream side of said mill stand;
F. thereafter uncoiling and discharging the workpiece from said upstream coiling furnace and passing it between the work rolls of said reversing finishing mill stand and further reducing it therein, the rolling speed on said pass being consonant with the speed cone on subsequent passes through continuous finishing stands and the rolling speeds on the two preceding passes on the reversing mill stand being higher than the speed on the third pass and unrelated to the aforesaid speed cone;
G. immediately thereafter passing said workpiece succes-

sively through and reducing it further in a plurality of continuous finishing stands; and

H. thereafter cooling the strip and coiling it on a finish coiler.

4,348,883

AUXILIARY DIE CONVEYOR FOR A PRESSING OR PUNCHING MACHINE

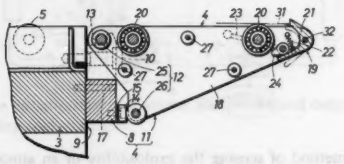
Keitaro Yonezawa, c/o Aioi Seiki K.K., 1-9 Aza Kaidoshita Kounike, Itamishi, Hyogoken, Japan

Filed Aug. 11, 1980, Ser. No. 177,122

Claims priority, application Japan, Oct. 1, 1979, 54-136345[U]

Int. Cl.³ B21J *13/00*

U.S. Cl. 72—446 **7 Claims**



1. An auxiliary die conveyor for attachment to a punching or pressing machine, said conveyor comprising:

a metal support adapted to be jointed to the bolster of said machine;

a die carrier including a pair of side plates and rollers for allowing a die to roll thereon;

said die carrier having an upper tail section and a lower section and including a hanging means in its upper tail section;

said metal support including a depression in its upper section, said depression being adapted to interlock with said hanging means;

said metal support including an abutment means in its lower section, said abutment means being adapted to allow said carrier to rest thereon.

4,348,884

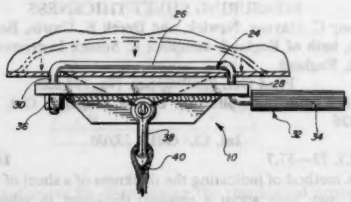
PULLING TOOL

Gerald P. Wivinis, Vacation Village 18-4, Fox Lake, Ill. 60020

Filed Feb. 6, 1981, Ser. No. 232,232

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—479 **5 Claims**



1. A pulling tool comprising, in combination, a first pulling member comprising a generally rectangular-shaped flat bar having a front side and a back side, a pair of apertures formed in said bar extending from the front side to the back side thereof, and a pull bar having an aperture therein fixedly secured to and extending outward perpendicular to one of said front and back sides of said flat bars, said first pulling member with said pair of apertures in said flat bar forming a template for drilling holes in a surface to be repaired; a second generally U-shaped pulling member having a straight portion and a pair of legs which are spaced-apart a distance corresponding to the distance between said pair of apertures in said flat bar, at least one of said pair of legs being threaded to receive a lock nut and the other one of said pair of legs having a handle integrally formed with and extending perpendicular thereto; and at least one lock nut; said pulling tool being affixed to a surface to be repaired by drilling two apertures in said surface using said first pulling member as a template, extending said pair of legs of said second pulling element through said two apertures in said first pulling element and through said two apertures in said surface with said straight portion disposed behind said surface to be repaired and with the two legs thereof projecting to the front of said surface and through the apertures in said first pulling member, said first and second pulling members being affixed together by said lock nut being threadedly affixed to said one leg.

4,348,885

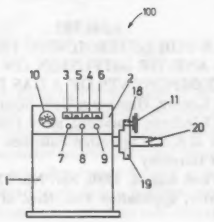
METHOD AND SYSTEM FOR OPERATIONAL TESTING OF A DEVICE FOR BALANCING BODIES OF ROTATION

H. Richard Mueller, Lynchburg, Va., assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,703

Int. Cl.³ G01M *1/22*

U.S. Cl. 73—1 B **19 Claims**



3. In a device for the balancing of a rotor in two balancing planes, said device including:

a clamping fixture,

a housing,

pickup means for bracing said clamping fixture in relation to said housing, and for developing pickup signals corresponding to unbalance of said rotor, and

computing means responsive to said pickup signals for computing and indicating a size and direction of said unbalance;

a system for testing said device, wherein said device is provided with a weight of known size mounted on said housing, and wherein said known weight is removable from said housing and mountable on said clamping fixture at a predetermined axial and radial location thereon, and comprising automatic entering means responsive to removal of said weight from said housing for automatically entering data corresponding to geometrical measurement of the position of said weight as mounted on said clamping fixture into said computing means.

4,348,886

MONITOR FOR OXYGEN CONCENTRATION IN ALUMINUM-BASED FILMS

Thomas J. Faith, Jr., Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,704

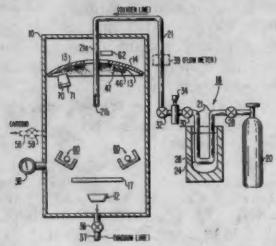
Int. Cl.³ G01N *27/12*

U.S. Cl. 73—19 **15 Claims**

1. A method of monitoring the concentration of oxygen in an aluminum-based film deposited in a vacuum chamber in which there is residual gaseous oxygen-specie comprising the steps of:

providing a flux of aluminum in the chamber;

depositing aluminum simultaneously both on a monitor substrate and at least one IC substrate such that the ratio of oxygen concentration to aluminum concentration on said monitor substrate is significantly greater than said ratio on said IC substrate; and



measuring the resistivity of the deposited aluminum film on said monitor substrate, the resistivity value on said monitor substrate having a much higher sensitivity to the oxygen content in said monitor film as compared to the sensitivity of the resistivity of the IC film to its oxygen content.

4,348,887

APPARATUS FOR DETERMINING THE EFFECTS OF DILUTION AND/OR DIFFUSION ON THE GASEOUS COMPONENTS OF A GAS FLOW

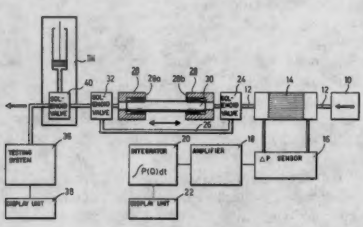
Hans-Walther Lorenz, Hamburg; Gerd Schumacher, Pinneberg, and Helmut Kirchner, Hamburg, all of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,573

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931647

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—23 **9 Claims**



1. An apparatus for determining the effect of dilution and/or diffusion of the gaseous components of a gas flow passing through a gas permeable test object said apparatus comprising:

(a) a source of calibrating gas;

(b) laminar resistance means coupled to said source of calibrating gas, said gas flowing through said laminar resistance means;

(c) volumeter means coupled to said laminar resistance means for measuring the volume of gas flowing therethrough;

(d) a test object, wherein said gas from said laminar resistance means flow through said test object;

(e) gas concentration measuring means for receiving gas from said test object and for measuring the concentration thereof;

(f) bypass means for bypassing the flow of gas around said test object; and

(g) suction means for drawing air from said source to said measuring means.

4,348,888

EXPLOSIMETER

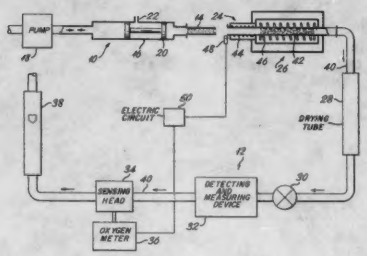
Timothy J. Snee, Buxton, England, assignor to National Research Development Corporation, London, England

Filed Oct. 1, 1980, Ser. No. 192,938

Claims priority, application United Kingdom, Oct. 11, 1979, 7935394

Int. Cl.³ G01N *31/12*

U.S. Cl. 73—23 **11 Claims**



1. A method of sensing the explosibility of an atmosphere which may contain a combustible gas or vapour or mist or aerosol comprises drawing a known volume of the atmosphere through a filter on which any condensible material condenses and into a container;

in a safe environment, establishing a steady flow of oxygen-containing gas through a combustion chamber and past an oxygen sensor, heating the filter and drawing the gas sample from the container through the heated filter as part of the steady gas flow through the combustion chamber so that any combustible material is completely oxidised causing a decrease in oxygen concentration in the gas flow; and

sensing and integrating any such decrease, and from the integrand determining the explosibility of the known volume.

4,348,889

MEASURING SHEET THICKNESS

Anthony C. Haynes, Newick, and Derek K. Unwin, Bexhill-on-Sea, both of England, assignors to Sussex Instruments Limited, England

Filed Oct. 7, 1980, Ser. No. 194,835

Claims priority, application United Kingdom, Oct. 8, 1979, 7934826

Int. Cl.³ G01B *13/06*

U.S. Cl. 73—37.7 **14 Claims**

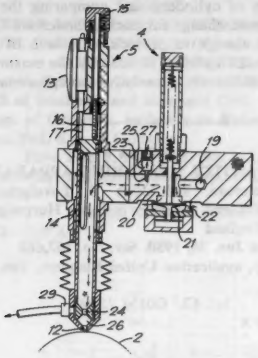
1. A method of indicating the thickness of a sheet of material which may vary about a nominal thickness, in which air is directed onto the surface of the material from a nozzle which communicates with a first chamber which is supplied with air via a restriction, comprising the steps of:

(a) positioning the nozzle such that, with a sheet of nominal thickness, the effective area of the nozzle from which air can escape is smaller than the area of the restriction;

(b) supplying air from the same source as that from which the first chamber is supplied to a second chamber having an outlet nozzle and an inlet restriction, the ratio of effective areas of which is substantially the same as that of said nozzle and said restriction of said first chamber; and,

(c) monitoring the difference in the pressures in the two

chambers with a differential pressure transducer so that the monitored output is substantially insensitive to pressure variations of said source, said monitored output indicating said thickness.

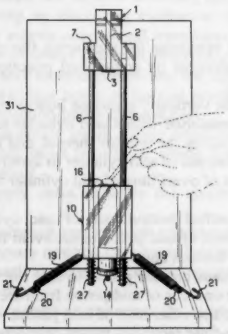


4,348,890

APPARATUS AND A PROCESS FOR DETERMINING THE RHEOLOGICAL PROPERTIES OF BIOLOGICAL FLUIDS

Maxime F. Hanss, 2 Allee de la Mairie d'Antan, Saint Witz, 95470 Survilliers, France

Filed Aug. 4, 1980, Ser. No. 175,329
Claims priority, application France, Aug. 17, 1979, 79 20833
Int. Cl.³ G01N *15/04*
U.S. Cl. 73—61.4 **21 Claims**



1. An apparatus for determining the rheological properties of biological fluids and particularly the deformability of the red corpuscles of the blood, comprising in combination:

a first upper transparent block containing in its center a capillary having an inner diameter between 1 and 10 mm, which block is provided with two level detectors;

a second lower transparent block provided with a central duct—facing the capillary of the upper block—inside which duct is housed a droptaking device, said duct being connected on the one hand to a drain circuit and on the other to a pressure-regulating circuit;

a filtering membrane housed between the two blocks; and

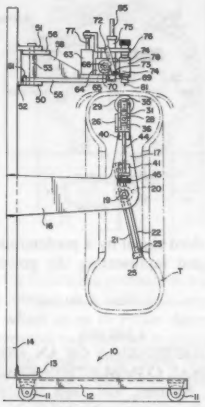
a frame for holding the apparatus.

4,348,891

TIRE HARDNESS TESTER

John M. Stickler, Stow, and George L. Shook, Akron, both of Ohio, assignors to The B F Goodrich Company, New York, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,207
Int. Cl.³ G01N *3/42*
U.S. Cl. 73—81 **12 Claims**



1. An apparatus for gauging the hardness of tire treads comprising a support, said support having bracket means at the upper end thereof, a durometer support means mounted on said bracket means, a durometer mounted on said support means for vertical movement, said durometer having a penetrator for contact with a tire tread to provide a hardness reading on said durometer, control means mounted on said durometer support means and operatively connected to said durometer for controlling the movement of said durometer at a uniform rate of descent, a tire support means connected to said intermediate portion of said support for presenting an upper tread portion to said durometer, and said tire support means having a tread support member located on the inner peripheral surface of a tire in alignment with said penetrator of said durometer.

4,348,892

APPARATUS AND METHOD FOR TESTING THE PERFORMANCE OF ELECTRICAL MACHINES

Ervin M. Emanuel, P.O. Box 2175, Prairie View, Tex. 77445

Filed Oct. 19, 1979, Ser. No. 86,532
Int. Cl.³ G01R *35/00*
U.S. Cl. 73—116 **16 Claims**

16. A method for determining the power angle of an A.C. generator including the steps of:

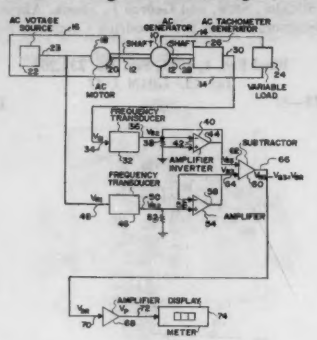
activating a generator;

varying a load on the generator;

determining the rotor speed of the generator and producing a first signal proportional to the rotor speed;

determining the synchronous rotating magnetic field of the generator and producing a second signal proportional to the synchronous rotating magnetic field;

producing a third signal which is equal to the difference between the first signal and second signal; and



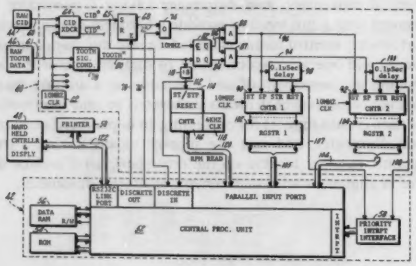
multiplying the third signal by a predetermined constant to produce a signal representing the power angle of the generator.

4,348,893

RELATIVE COMPRESSION OF AN ASYMMETRIC INTERNAL COMBUSTION ENGINE

Tony D. Hendrix, Kokomo, Ind., and Rinaldo R. Tedeschi, Newington, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 13, 1979, Ser. No. 93,656
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **7 Claims**



1. A method of measuring the relative compression of the cylinders of an asymmetric firing internal combustion engine of the type having cylinders grouped in one or more pairs where the cylinders in each pair are spaced from each other by a first crankshaft angle and each pair is spaced from adjacent pairs by a second crankshaft angle value greater than the first, the steps of:

cranking the engine without ignition,

detecting the occurrence in each engine cycle of an engine event occurring in each cycle at a defined crankshaft angle,

measuring the angular rotation of an engine member mounted to and rotating with the engine crankshaft to provide a signal manifestation of the angular speed of the crankshaft and recording the successively sampled signal manifestations of crankshaft speed versus successive equal intervals of crankshaft angle referenced to the crankshaft index signal in each cycle to provide information of the change in crankshaft speed as a function of crank shaft angular displacement from said index point;

measuring the rate of change of the signal manifestation of crankshaft speed versus crankshaft angle provided by each cylinder and recording a speed change value associated with each cylinder;

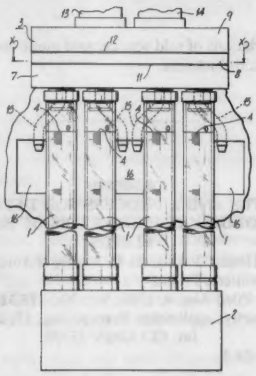
determining the maximum speed change signal from among the plurality of cylinders; and comparing the recorded values of speed change for each cylinder with the maximum speed change to provide as a ratio of the speed change for each cylinder divided by the maximum speed change an indication of relative compression for each cylinder.

4,348,894

FUEL QUANTITY MEASURING APPARATUS

Reginald S. Emerson, and John E. Lovelock, both of Buckingham, England, assignors to Leslie Hartridge Limited, Buckingham, England

Filed Jun. 24, 1980, Ser. No. 162,662
Claims priority, application United Kingdom, Jun. 29, 1979, 7922649
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **11 Claims**



1. Measuring apparatus for measuring the quantity of calibration fluid delivered by engine-fuel injection means, comprising:

(a) at least one vertically arranged hollow cylinder;

(b) a piston contained within said cylinder and able to slide within and along the interior thereof, and free to slide out of the bottom end of said cylinder to avoid excess pressure in the event of overfilling of said cylinder with calibration fluid;

(c) a bell-mouthed bottom end of said cylinder for easy re-engagement of said piston in the event that it does slide out of said bottom end;

(d) sealing means on said piston to seal the interior of said cylinder on one side of said piston from the interior of said cylinder on the other side of said piston;

(e) calibration-fluid receiving means connected to one end of said cylinder to enable calibration fluid to be conveyed to the interior of said cylinder on one side of said piston to displace the latter in one direction along said cylinder's interior;

(f) indicating means to indicate the position of said piston in relation to said cylinder, whereby the volume of calibration fluid which displaces said piston can be measured;

(g) draining means connected to said one end of said cylinder to enable calibration fluid to be drained from said cylinder's interior; and

(h) pressurized gas pressure-transmitting means connected to the other end of said cylinder to enable the pressure of pressurized gas to be transmitted to the interior of said cylinder on the other side of said piston to displace the latter in the opposite direction along said cylinder's inte-

rior whereby calibration fluid is drained from said cylinder's interior through said draining means.

4,348,895

METHOD FOR ANGULARLY CORRECT MOUNTING OF A FUEL INJECTION PUMP ON AN INTERNAL COMBUSTION ENGINE

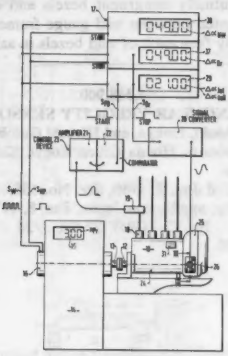
Max Straubel; Reinhard Schwartz; Ernst Ritter; Ilija Djordjevic, all of Stuttgart, and Reinhard Döll, Böblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,712

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949018

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A 15 Claims



1. A method for ascertaining the correct angular mounting of a fuel injection pump having a housing and a camshaft with an angle transducer mark on an internal combustion engine having a crankshaft, the angular mounting system including a test bench having an electronic evaluation circuit, an electronic dynamic supply onset signal transducer, a rotary position transducer to detect camshaft position, a display, and a camshaft lock, said method comprising the steps of:

mounting the injection pump on the test bench,

operating the injection pump at a test rpm,

measuring the injection pump supply onset with the electric dynamic supply onset transducer which generates a signal indicative thereof,

feeding the supply onset signal to the electronic evaluation circuit,

revolving the camshaft and the angle transducer mark thereon,

triggering the rotary position transducer by means of the angle transducer mark to generate a signal representing camshaft rotary position,

feeding the rotary position signal into the electronic evaluation circuit,

ascertaining a first signal distance between the rotary-position signal and the supply onset signal in the electronic evaluation circuit,

indicating the signal distance on the injection display,

marking the first signal distance on the injection pump,

shutting off the test bench,

rotating the camshaft to a predetermined position relative to the dynamic supply onset, taking into consideration the marked first signal distance,

locking the camshaft,

positioning the crankshaft at a predetermined distance from top dead center,

mounting the injection pump on the internal combustion engine.

4,348,896

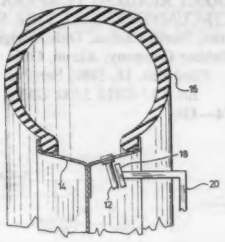
APPARATUS FOR INDICATING PRESSURE IN PNEUMATIC TIRES

Athanase K. Sarides, 88 Baroness Crescent, Willowdale, Ontario M1P 4T6, Canada

Filed Sep. 24, 1980, Ser. No. 190,124

Int. Cl.³ B60C *23/02*

U.S. Cl. 73—146.5 5 Claims



1. Apparatus for indicating pressure in a pneumatic tire on a wheel while in motion on a vehicle, comprising an actuator secured to the wheel so as to rotate therewith, the actuator including an extensable bag member in communication with air in the tire, resilient means controlling extension of the bag member along a linear path extending substantially radially of the tire by air in the tire to cause the bag member to be extended by an amount indicative of the air pressure in the tire, and magnetic means positioned along said liner path in accordance with the amount of extension of the bag member and therefore in accordance with the air pressure in the tire, a plurality of magnetically actuated means mounted on the vehicle adjacent said linear path for selective actuation by the magnetic means of the actuator in accordance with the position of the magnetic means as it rotates with the tire, and indicating means connected to the magnetically actuated means to indicate air pressure in the tire by indicating the magnetically actuated means selectively actuated.

4,348,897

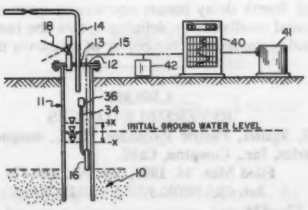
METHOD AND DEVICE FOR DETERMINING THE TRANSMISSIBILITY OF A FLUID-CONDUCTING BOREHOLE LAYER

Irene Krauss-Kalweit, Schwarzwaldweg 5a, 6094 Bischofsheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 58,519, Jul. 18, 1979, abandoned. This application Aug. 1, 1980, Ser. No. 174,632

Int. Cl.³ E21B *47/10*

U.S. Cl. 73—155 6 Claims



1. Method for the determination of the transmissibility of a fluid-conducting borehole layer, especially of an aquifer, comprising the steps of

stimulating the fluid-level in a borehole to a periodic or an aperiodic damped oscillation,

measuring the movement of the fluid-level with a pressure transducer,

recording the movement of the fluid-level on a digital or analog recorder, and

evaluating the recorded movement to produce a factor related to the transmissibility.

4,348,898

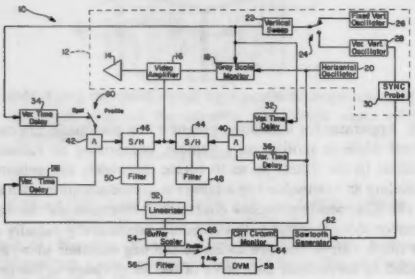
DIRECT READING TEMPERATURE AND CIRCUMFERENTIAL TIRE MONITOR

Aurel V. Stan, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 11, 1980, Ser. No. 120,242

Int. Cl.³ G01J *5/00*; G01M *17/02*

U.S. Cl. 374—124 **16 Claims**



1. In a thermal scanner having an infrared detector and a video amplifier for sensing an object of unknown temperature and a reference of known temperature and presenting output signals corresponding to said temperatures, and a monitor connected to the video amplifier and controlled by a horizontal oscillator and a vertical sweep circuit for creating a raster scan of the object and reference, the improvement, comprising:

first delay means interconnected between the video amplifier, horizontal oscillator, and vertical sweep circuit for selecting a first video signal from the raster scan indicative of the temperature of the reference, said first video signal occurring at a coincidence of first outputs from the horizontal oscillator and vertical sweep circuit;

second delay means interconnected between the video amplifier, horizontal oscillator, and vertical sweep circuit for selecting a second video signal from the raster scan indicative of the temperature of the object, said second video signal occurring at a coincidence of second outputs from the horizontal oscillator and vertical sweep circuit;

circuit means connected to said first and second delay means, receiving said first and second video signals and producing therefrom an electrical signal indicative of the temperature of the object as a function of said first and second video signals; and

third and fourth delay means operatively connected to said horizontal oscillator for defining within the raster scan the physical boundaries of the object of unknown temperature.

4,348,899

REVERSIBLE GAUGES

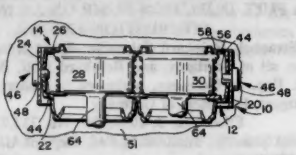
Leslie D. Muller, Pacific Palisades, Calif., assignor to Orion Industries, Inc., Compton, Calif.

Filed Mar. 14, 1980, Ser. No. 130,479

Int. Cl.³ B60K *37/02*; G01D *11/30*

U.S. Cl. 73—431 **7 Claims**

1. A gauge mount for location facing forward the interior of a vehicle cab in the instrument panel area in the cab of the vehicle comprising first and second gauge frames releasably secured each to the other, each of said gauge frames having a rim about the perimeter thereof, and said frames are arranged to fit together in back to back fashion each with an outer surface having at least one bezel therein, said bezels in said back to back frames facing in opposite directions, and said rims are congruently aligned, and each bezel of each of said frames is mutually congruent to a bezel in the other frame, and said outer surfaces of said frames have markings distinct from one



another, and further comprising a gauge resiliently confined between means on the interior of said frames and fitted against said pair of mutually congruent bezels and arranged to be reversibly mounted between said gauge frames to selectively and alternatively face each of said bezels in said pair.

4,348,900

ANGULAR VELOCITY SENSOR

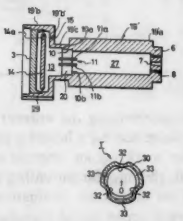
Fumitaka Takahashi, Houya, and Hiroshi Gotoh, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,428

Claims priority, application Japan, Jun. 8, 1979, 54-77877[U]

Int. Cl.³ G01P *15/08, 3/26*

U.S. Cl. 73—505 **1 Claim**



1. An angular velocity sensor, which comprises: an outer casing including a central space extending axially thereof, said outer casing being formed of a hollow cylindrical member having one end opened and the other end closed, said hollow cylindrical member having an inner peripheral wall thereof formed with a plurality of inward protuberances extending axially thereof and arranged at circumferentially equal intervals, wherein axially extending gas flow passages are defined between adjacent ones of said inward protuberances and associated outer peripheral surfaces of said inner casing, a plurality of axial gas flow passages formed around said central space, an opening formed in one end thereof and an end wall closing the other end thereof; an inner casing mounted within said outer casing, said inner casing including an opening formed in one end thereof, a hollow cylindrical portion fitted within said central space of said outer casing and defining therein a central gas flow passage extending axially thereof, an end wall provided at the other end thereof and having an axial nozzle hole formed diametrically centrally thereof and communicating with said central gas flow passage and axial gas flow passage in said outer casing, a gas flow sensor holding portion provided in said hollow cylindrical portion in spaced and concentric relation to said nozzle hole, and a pump housing portion provided in said opening in said inner casing; a gas flow sensor fitted in said gas flow sensor holding portion, said gas flow sensor including a pair of thermo-sensitive elements arranged in symmetrical relation with respect to the axis of said nozzle hole for detecting the temperature of a gas jet supplied thereto through

said nozzle hole; and pump means incorporated in said pump housing portion for supplying gas into said axial gas flow passages in said outer casing, wherein said hollow cylindrical portion, end wall, gas flow sensor holding portion and pump housing portion of said inner casing are integrally formed of a one-piece structure.

4,348,901

APPARATUS FOR MONITORING THE DEGREE OF COMPACTION

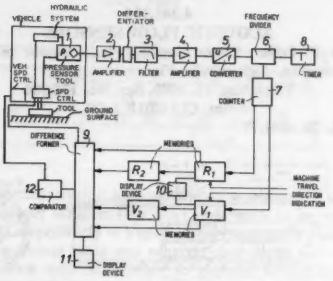
Gülertan Vural, Emmelshausen, and Uwe Blancke, Koblenz, both of Fed. Rep. of Germany, assignors to Koehring GmbH-BOMAG Division, Boppard, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 198,266

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942334

Int. Cl.³ G01N *3/36*; E01C *19/34*

U.S. Cl. 73—594 **10 Claims**



1. In apparatus for monitoring the degree of compaction achieved by a compacting device including at least one vibrating compacting tool which device is mounted on a vehicle arranged to travel back and forth over a surface to be compacted, the apparatus including means for detecting the value of an operating parameter which has a known relationship to the effective power of the vibrating compacting tool during each pass of the vehicle over the surface and which is representative of the degree of compaction achieved, the improvement comprising:

representation storage means connected to said detecting means for separately storing representations of the detected values associated with each direction of travel of the vehicle;

and difference forming means connected to said storage means for providing a representation of the difference between detected values associated with successive passes of the vehicle in the same direction.

4,348,902

ULTRASONIC IMAGING SYSTEM USING PLURAL SQUARE WAVE PULSE TRAINS OF SUCCESSIVELY DELAYED INTERVALS

Ryobun Tachita, Kawasaki; Yoshihiro Hayakawa; Kazuyoshi Irioka, both of Sagamihara; Hiroshi Fukukita, Tokyo; Tsutomu Yano, Kawasaki, and Akira Fukumoto, Michida, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Nov. 14, 1980, Ser. No. 206,827

Claims priority, application Japan, Nov. 16, 1979, 54-149385

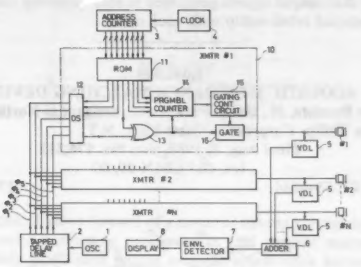
Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **4 Claims**

1. An ultrasonic imaging system having an array of successively arranged piezoelectric transducers, comprising:

a clock pulse source for generating a plurality of trains of square wave pulses each having a duration that is an integral multiple of a unit quantization time interval, the square wave pulses of each train being delayed by said unit quantization time interval with respect to the square wave pulses of adjacent trains;

a plurality of transmitter circuits respectively corresponding to said piezoelectric transducers, each of said transmitter circuits comprising: a memory in which a set of different digital delay time data is stored, each of the delay time data including a first selection data, a bit inversion data and a second selection data; a selector for selecting one of said pulse trains in accordance with said first selection; an Exclusive-OR function means for inverting or not inverting the binary state of said selected square wave pulses



depending on the binary states of said bit inversion data; a programmable counter for counting the output of said Exclusive-OR function means to generate an output in accordance with said second selection data; and means for gating the output of said Exclusive-OR function means to the corresponding piezoelectric transducer in response to the output of said counter; and

means for retrieving each delay time data from each memory of said transmitter circuits at periodic intervals corresponding to angular increments of an ultrasonic beam transmitted from said transducer array.

4,348,903

ELECTROMAGNETIC ULTRASONIC APPARATUS

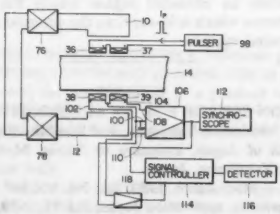
Ichiya Sato, Hitachi; Kazuo Miyagawa; Yukito Sasaki, both of Kisarazu; Koji Kawamura; Shuichi Sato, both of Kimitsu; Soji Sasaki, Hitachi; Jun Kubota, Hitachi, and Susumu Itoh, Hitachi, all of Japan, assignors to Nippon Steel Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,043

Claims priority, application Japan, Aug. 24, 1979, 54-107190

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—643 **7 Claims**



1. An electromagnetic ultrasonic apparatus for examining materials by using ultrasonic waves, comprising a first magnetic pole having a continuous end surface which is in close proximity and in opposition to a material to be examined; a second magnetic pole having a continuous end surface which is in close proximity and in opposition to the material, and having a polarity opposite to that of said first magnetic pole; DC

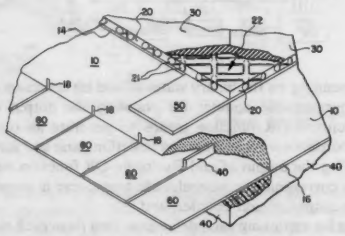
magnetic field generating means for supplying a DC magnetic field to said first and second magnetic poles; a pair of transmitting coils which are provided between the material and the end surface of said first magnetic pole and which face different portions of a surface of the material; a pair of receiving coils which are provided in a space between the material and the end surface of said second magnetic pole and which are opposed to said transmitting coils, respectively; pulse signal generating means for supplying a pulse current to said transmitting coils; and signal control means for amplifying and controlling output signals generated in said receiving coils, said transmitting coils and said receiving coils being connected together such that output signals generated in said receiving coils have differential relationship with each other.

4,348,904

ACOUSTIC IMPEDANCE MATCHING DEVICE

Peter Bautista, Jr., Buena Park, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 8, 1980, Ser. No. 176,312
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—644 **17 Claims**



1. An impedence matching device for coupling wideband acoustic energy between an active surface of one or more acoustic transducers having a first acoustic impedence and an object having a second acoustic impedence, comprising:

a layer of sound conductive material having an acoustic impedence intermediate the first acoustic impedence and the second acoustic impedence disposed over the active surface of the transducers; and

a mesh disposed over the active surface of the transducers, the mesh having strands which define open spaces therebetween; wherein

the sound conductive material comprises loaded regions which are disposed within the open spaces of the mesh and which have an acoustic impedence which is greater than the acoustic impedence of the mesh and further comprises an unloaded region which has an acoustic impedence which is lower than the acoustic impedence of the loaded regions.

4,348,905

VIBRATION SENSOR FOR AN AUTOMOTIVE VEHICLE

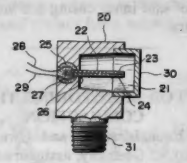
Toshifumi Nishimura, Yokosuka, and Kunihiko Sugihara, Takasho, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 8, 1980, Ser. No. 166,947
Claims priority, application Japan, Jul. 13, 1979, 54-96577[U]
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—654 **4 Claims**

1. A vibration sensor for an automotive vehicle comprising:

(a) a housing having a first cavity, a second cavity, and an opening in said housing between said cavities;

(b) an elongated piezoelectric vibration element extending through said opening, the free end of said element being positioned within said first cavity to vibrate freely therein in cantilever fashion, the fixed end of said element being positioned within said second cavity and being fixed in position therein by a bonding material; and



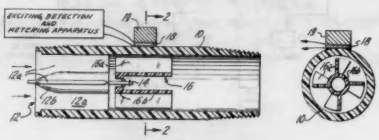
(c) means for conducting a piezoelectric signal in response to the vibration of said piezoelectric element, said means for conducting the signal being fixed in position within said second cavity by a bonding material.

4,348,906

ACOUSTIC FLOW SENSORS

Murray F. Feller, Citrus County, Fla., assignor to Wilgood Corporation, Jacksonville, Fla.

Filed Aug. 11, 1980, Ser. No. 176,904
Int. Cl.³ G01F *1/00*
U.S. Cl. 73—861.77 **9 Claims**



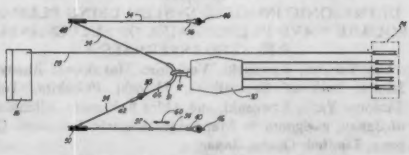
9. A method of producing signals representing the flow of fluid in a passage, including the steps of disposing a flow-metering rotor having vanes defining a series of pockets in the path of the fluid for operation thereby, emitting an acoustic carrier from a fixed position toward the pockets of the rotor, at a fixed position receiving the carrier modulated by the shifting pockets of the rotor, and from the received signal deriving a signal representing the operation of the flow-metering rotor.

4,348,907

RETIREMENT ELONGATION INDICATOR FOR MAST RAISING LINES

Gene E. Giese, 11121 Springhollow Rd., Suite 111, Oklahoma City, Okla. 73120

Filed Mar. 3, 1980, Ser. No. 126,177
Int. Cl.³ G01L *5/04*
U.S. Cl. 73—862.39 **8 Claims**



1. Apparatus for use in raising or lowering a derrick drilling mast on a substructure including A-leg sheaves and a drawworks extending a drilling line to the travelling hook, comprising:

a mast raising line connected to move the derrick arcuately in response to a corresponding movement of a drilling line by the drawworks;

first and second sleeves secured on said cable at a preselected distance X in separation; and

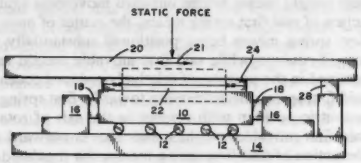
measuring bar means for periodically measuring between said first and second sleeves when said mast raising line is unstressed to detect a permanent elongation distance X plus E of said mast raising line, where E is approximately 70 percent of the specified elongation limit per unit length X and Elongation Limit=(Tension-Length X)÷(Metallic Area·Modulus of Elasticity).

4,348,908

POWER MEASURING ARRANGEMENT FOR VIBRATORY WELDER

Andrew Shoh, Ridgefield, Conn., assignor to Branson Ultrasonics Corporation, Newtown, Conn.

Filed Jan. 19, 1981, Ser. No. 226,195
Int. Cl.³ G01L *3/24*
U.S. Cl. 73—862.54 **7 Claims**



1. A power measuring arrangement in combination with a vibratory welder wherein two workpiece parts to be welded are disposed respectively in a substantially stationary plate and an opposing driver plate and wherein said plates are urged toward contact with each other to provide forced contact between said workpiece parts perpendicular to a weld plane defined by the surface along which the parts are to be welded and wherein said driver plate is reciprocatingly vibrated along said weld plane, the improvement comprising:

means disposed for providing a first electrical signal commensurate with the force exerted by the substantially stationary plate in the weld plane;

means disposed for providing a second electrical signal responsive to the velocity of the driver plate relative to said stationary plate in the weld plane;

multiplying means coupled for receiving said first signal and said second signal and providing an output signal which is proportional to the product of said first signal and of said second signal, and

means coupled for averaging said output signal and indicating a value commensurate with the averaged output signal.

4,348,909

SAMPLING PROBE FOR TAKING PARTIAL LIQUID QUANTITIES FROM VARIOUS PHASES OF TWO IMMISCIBLE LIQUIDS

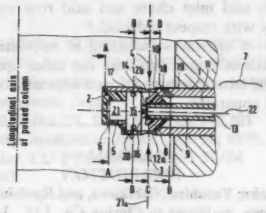
Manfred Kluth, Neuthard; Heinz Antoni, Eggenstein-Leopoldshafen, and Werner Stich, Linkenheim-Hochstetten, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,570
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933368
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.21 **9 Claims**

1. A sampling probe for sampling partial quantities of liquid in a countercurrent extraction column wherein said liquid has first and second immiscible phases moving in mutually opposite directions, said probe comprising:

(a) an extraction tube having first and second radially opposed ports in the surface thereof, said extraction tube being adapted for extending into the liquid within said column and positioned so that said first and second phases impinge upon the respective opposite portions of the extraction tube surface containing said radially opposing ports;

(b) a stopper formed of a material which promotes coalescence with respect to said first phase fitted into one end of said extraction tube, said stopper having a cavity therein and a plurality of apertures located in the side of said stopper aligned with the portion of said extraction tube aganst which said first phase impinges; and



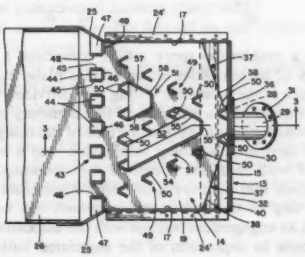
(c) a conical valve formed of a material having substantially the same coalescing properties as said stopper material slidably positioned within said extraction tube between said stopper and the other end of said tube, said valve having channels therein for connecting the cavity in said stopper with the interior of said extraction tube.

4,348,910

SPONGE IRON PRODUCTS SAMPLING DEVICE

Gorden F. Johnson, Pittsburgh, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 88,887, Oct. 29, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,291
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.51 **8 Claims**



1. For a conveyor adapted to convey a pelletized product, said conveyor having a tubular wall provided with an opening in one side thereof, the improvement of a product sampling apparatus comprising:

a housing including side walls and end walls,

a lower wall,

an intermediate wall,

a cover wall, with said walls interconnected to provide an upper and lower chamber,

a first outlet connection communication with said upper chamber adjacent a first end thereof,

a second outlet connection communicating with said lower chamber,

an inlet chute connected to said upper chamber adjacent a second opposite end thereof,

means connecting said sampling apparatus in inclined planar relation to said conveyor side wall whereby said inlet chute communicates with the interior of the conveyor to direct product to said upper chamber,

baffle means on said intermediate wall in said upper chamber disposed in the path of movement of said product,

sorting apertures in said intermediate wall communicating with said lower chamber,

said baffle means and sorting apertures being arranged and constructed to direct and divide a larger quantity of product into smaller representative pelletized samples whereupon they are respectively discharged from said chambers through said first and second outlet connectors,

said sorting apertures including a first row positioned adjacent to said inlet chute and said row extending transversely with respect thereto,

said row of apertures including at opposite ends thereof apertures of larger size than the other apertures of said row, the latter being positioned adjacent to the side walls of said apparatus.

4,348,911

PUSHBUTTON

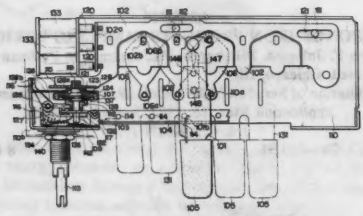
Yoshio Tanaka; Yasuhisa Nishikawa, and Ryoichi Hasumi, all of Toda, Japan, assignors to Clarion Co., Ltd., Japan

Filed Dec. 11, 1979, Ser. No. 102,421

Claims priority, application Japan, Dec. 13, 1978, 53-153221; Dec. 18, 1978, 53-172141[U]; Dec. 19, 1978, 53-173109[U]; Feb. 22, 1979, 54-021009[U]

Int. Cl.³ H03J *5/12*; F16D *13/50*

U.S. Cl. 74—10.33 **10 Claims**



1. In a pushbutton tuner which comprises: a baseplate; a plurality of button slides arranged in a plane parallel with a major face of the baseplate; setting pins provided to the button slides, respectively; a plurality of link members pivotally supported with respect to said major face of the baseplate, a plane parallel therewith, a tuning mechanism; and a memory slide engaged with said link members for operating said tuning mechanism; said memory slide being displaceable upon rotation of any of the link members which has been actuated through an engagement thereof with the associated setting pin in response to depression of the associated button slide; the improvement wherein each of said link members have oppositely angled edges on opposite sides thereof, and each of said setting pins being adapted to act on the confronting edges of the respective adjacent two link members to pivot the same.

4,348,912

VARIABLE AMPLITUDE VIBRATOR APPARATUS

Hubert E. Thomas, 300 Prospectors Rd., #25, Diamond Bar, Calif. 91765

Continuation-in-part of Ser. No. 68,343, Aug. 21, 1979. This application May 27, 1980, Ser. No. 153,203

Int. Cl.³ F16H *33/00*

U.S. Cl. 74—61 **12 Claims**

1. A variable amplitude vibratory apparatus comprising:

shaft means supported for rotation about an axis;

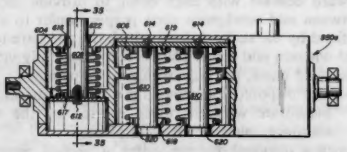
first movable weight means mounted eccentrically on said shaft means for rotation therewith for movement between a position of relatively reduced eccentricity and a position of relatively increased eccentricity with respect to the axis of rotation;

first spring means biasing said first movable weight means toward the position of relatively reduced eccentricity;

second movable weight means mounted eccentrically on said shaft means for rotation therewith for movement between a position of relatively reduced eccentricity and a position of relatively increased eccentricity with respect to the axis of rotation, said second movable weight means being mounted with its center of mass on the opposite side of said shaft means from the center of mass of said first movable weight means;

second spring means biasing said second movable weight means toward the position of relatively reduced eccentricity;

said first spring means being preloaded to retain said first movable weight means in the position of relatively reduced eccentricity so that said shaft means remains balanced until the rotational shaft velocity increases above a first predetermined magnitude whereupon said first movable weight means begins outward movement against the action of said first spring means, the center of mass of said first spring means being positioned substantially on the axis of rotation while said first movable weight means is retained in the position of relatively reduced eccentricity, said first spring means moving toward a first spring means eccentric position with respect to the axis of rotation as said first movable weight means moves outward against the action of said first spring means, the regulated movement of said first movable weight means and said first spring means combining to progressively unbalance said shaft means until maximum unbalance is achieved at a higher, second predetermined magnitude of rotational shaft velocity;



said second spring means being preloaded to retain said second movable weight means in the position of relatively reduced eccentricity until the rotational shaft velocity increases beyond a higher, third predetermined magnitude whereupon said second movable weight means begins outward movement against the action of said second spring means toward the position of relatively increased eccentricity, the center of mass of said second spring means being positioned substantially on the axis of rotation while said second movable weight means is retained in the position of relatively reduced eccentricity, said second spring means moving toward a second spring means eccentric position with respect to the axis of rotation as said second movable weight means moves outward against the action of said second spring means, the movement of said second movable weight means and said second spring means combining to substantially reduce the unbalance of the shaft means caused by the positioning of said first weight means and first spring means in the position of maximum eccentricity until said shaft is balance at a higher, fourth predetermined magnitude of rotational shaft velocity, said second spring means being selected to define a predetermined range of rotational velocity between the third and fourth predetermined magnitude of rotational shaft velocity so that the amplitude of said apparatus may be selectively varied within the predetermined range;

first rod means mounted on said shaft means and having a first spring retainer, said first rod means extending substantially perpendicularly to the axis of rotation of said shaft means and slidably supporting said first movable

weight means, said first spring means comprising a helical compression spring mounted concentrically about said first rod means and preloaded by said first spring retainer;

second rod means mounted on said shaft means and having a second spring retainer, said second rod means extending substantially perpendicularly to the axis of rotation of said shaft means and slidably supporting said second movable weight means, said second spring means comprising a helical compression spring mounted concentrically about said second rod means and preloaded by said second spring retainer;

first stop means for limiting outward movement of said first movable weight means and first spring means;

second stop means for limiting outward movement of said second movable weight means and second spring means; and

said shaft means comprising enclosing structure extending between two end plates containing said first and second movable weight means and said first and second spring means therein and having first and second apertures for passage of the respective movable weight means, said first and second movable weight means comprising elongate hollow members, said first and second spring means being contained within the fist and second movable weight means, said first and second rod means extending from the enclosing structure into the first and second movable weight means, said first and second spring means being compressed between the interior of the first and second movable weight means and the first and second spring retainers, respectively.

4,348,913

TRANSMISSION FOR A VEHICLE

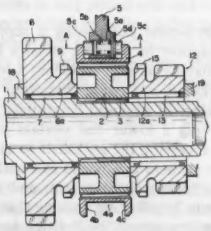
Koji Nozawa, Higashikurume, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 30, 1979, Ser. No. 98,857

Claims priority, application Japan, Dec. 8, 1978, 53-152172

Int. Cl.³ F16H *3/38*

U.S. Cl. 74—339 **4 Claims**



1. A transmission for an automotive vehicle, comprising:

a main shaft;

a synchrohub fixedly supported on said main shaft;

a forward gear rotatably supported on said main shaft on one side of said synchrohub;

a reverse gear rotatably supported on said main shaft on the side opposite to the said one side of said synchrohub;

a first clutch gear integrally formed on a side of said forward gear adjacent to the said one side of said synchrohub;

a second clutch gear integrally formed on a side of said reverse gear adjacent to the said opposite side of said synchrohub;

a coupling sleeve mounted on said synchrohub for movement along said main shaft to effect selective engagement with said first or second clutch gears, said coupling sleeve having a circular external groove;

a shift fork having one end portion which is received in the circular external groove of said coupling sleeve with a predetermined range of relative motion available therebetween, for shifting said coupling sleeve along said main shaft, the said one end of said shift fork having a plurality of holes therein which are parallel to said main shaft;

springs received in said holes; and

slide pieces having oppositely disposed back and front ends, the back ends of said slide pieces being received in said holes and being biased by said springs and the front ends of said slide pieces abutting against the sides of said circular external groove, whereupon said shift fork is biased to an intermediate position in said range.

4,348,914

MOUNTING STRUCTURE FOR A LUBRICATING OIL CHANNEL OF AN EXTENSION BUSHING

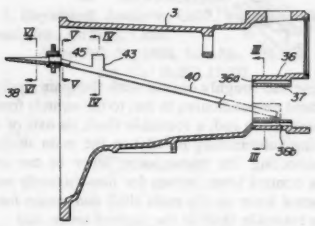
Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1980, Ser. No. 115,201

Claims priority, application Japan, Jan. 30, 1979, 54-9861

Int. Cl.³ F01M *9/10*; F16H *57/04*

U.S. Cl. 74—467 **3 Claims**



1. In a vehicle transmission housing having a lubricating oil channel connected at one end to an oil reservoir and connected at the other end adjacent to an element requiring lubrication, improved means for mounting the channel to the interior surface of the transmission housing comprising:

(a) resilient anchoring means formed on said channel intermediate the channel ends;

(b) an interiorly opening cavity formed in the interior surface of the transmission housing; and

(c) said anchoring means and said cavity both having similar substantially C-shaped cross-sections which progressively taper in a direction parallel to the major dimension of the channel, said anchoring means being initially resiliently compressed and inserted into said cavity, and being subsequently expanded and prevented by its size and shape from being removed from said cavity.

4,348,915

SWITCHING APPARATUS FOR THE MECHANICAL REMOTE CONTROL OF THE GEAR BOX OF A MOTOR VEHICLE

Wulf Leitermann, Bad Wimpfen, and Karl Pflugfelder, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi NsU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 149,016

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922137

Int. Cl.³ G05G *9/16*

U.S. Cl. 74—473 R **4 Claims**

1. Switching arrangement for the mechanical remote control of a motor vehicle gear box having a main shaft comprising:

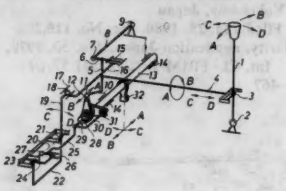
a gear lever;

means for mounting the gear lever for longitudinal and transverse movement with respect to the motor vehicle;

a gear selector rod having an at least two armed intermediate link;

means for connecting the gear lever to the gear selector rod;

means for connecting one arm of the intermediate link to the gear box comprising a first ball and socket joint means, a pin mounted on the one arm to extend roughly parallel to the gear selector rod such that its longitudinal axis intersects the centre of rotation of the first ball and socket joint means, a transmission rod for converting longitudinal movement of the gear selector rod into rotating movement, said transmission rod extending substantially perpendicular to the gear selector rod; means for rotatably mounting one end of the transmission rod on the pin, a transmission lever, means for connecting the other end of the transmission rod to the transmission lever, second ball and socket joint means for rotatably mounting the transmission lever about an axis fixed with respect to the vehi-



cle frame and roughly coaxial with the main shaft and for movement perpendicular, in use, to the vehicle frame or to the transmission rod, a rotatable shaft, its axis of rotation extending substantially parallel to the main shaft, means for connecting the transmission lever to the rotatable shaft, a control lever, means for non-rotatably mounting the control lever on the main shaft and means for engaging the rotatable shaft in the control lever; and

means for connecting the second arm of the intermediate link to the gear box comprising a selector lever, means for rotatably mounting the selector lever on the main shaft and for holding the selector lever against axial movement thereon and a third ball and socket joint means for connecting the arm to the selector lever.

4,348,916

BRAKE OPERATING DEVICE FOR A BICYCLE

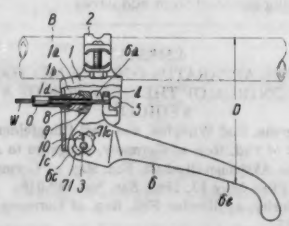
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 24, 1980, Ser. No. 162,586

Claims priority, application Japan, Jul. 2, 1979, 54-91975[U]; Jul. 23, 1979, 54-102173[U]; Jul. 27, 1979, 54-104394[U]

Int. Cl.³ G05G *7/00*; F16C *3/28*; B62L *3/02*

U.S. Cl. 74—489 **5 Claims**



1. A brake operating device for operating bicycle brakes through a control wire comprising a bracket member fixed to a handle bar of said bicycle, a lever shaft supported to said bracket member, and a control lever pivoted to said bracket member through said lever shaft, said control lever having a pivot portion surrounding said lever shaft and a grip portion, said grip portion being displaceably between a brake applying position in closest proximity with respect to said handle bar and a rest position farthest away from said handle bar, said lever shaft being positioned on a straight line passing through a substantially central portion between the brake applying position and the rest position of the distal end of said grip portion, said lever shaft including bushes having eccentric shaft holes respectively so that said lever is supported swingably to said lever shaft through said bushes, said brake operating device further comprising means for circumferentially rotating said bushes with respect to said bracket member to alter the position of said lever shaft and a grip dimension existing between said lever and said handle bar, and means for moving said control wire to operate said brakes in accordance with swinging motion of said lever about said lever shaft.

4,348,917

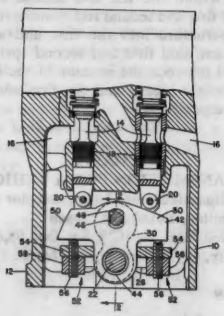
CONTROL MECHANISM WITH ADJUSTABLE FLOATING CAM

Frank H. Gardner, Hudson, and Carl E. Kittle, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 26, 1980, Ser. No. 191,643

Int. Cl.³ F16H *53/00*

U.S. Cl. 74—568 R **3 Claims**



1. Control mechanism comprising a support, a rockshaft carried by the support for rocking about a horizontal axis, a rocker element having an arm including a lower end portion fixed to the rockshaft and rising therefrom to an upper end portion, a cam element disposed lengthwise and alongside of the arm and having a lower end portion provided with an opening loosely receiving the rockshaft so as to enable movement of the cam element relative to and both lengthwise and crosswise of the rocker element arm, and a connection between the elements for effecting rocking thereof in unison and including lost-motion means for limiting lengthwise relative movement of the cam element, said lost-motion means including a pivot spaced vertically from the rockshaft axis and about which the lower end portion of the cam element may swing relative to the rocker arm element within the limits of said opening.

4,348,918

SPEED CHANGE DEVICE

Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Jan. 30, 1980, Ser. No. 116,750

Claims priority, application Japan, Feb. 21, 1979, 54/19394; Aug. 31, 1979, 54/110236

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—805 **9 Claims**

1. A speed change device which comprises:

a first outer gear secured to an input shaft;

a plurality of second outer gears meshing with said first outer gear;

a plurality of rotatably mounted crankpins which are connected to said second outer gears so that the rotary move-

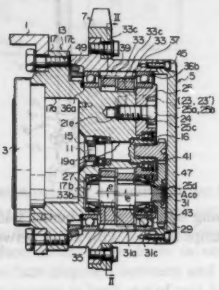
ment of said second outer gears is transmitted into a rotational movement of said crankpins;

an eccentrically revolving pinion which has a plurality of pin holes formed therein, and which are circumferentially spaced from each other, and outer gear teeth formed on a periphery thereof;

said crankpins being inserted into said pin holes so that the eccentric revolutional movement of said pinion is generated by means of said rotational movement of said crankpins; and

a hub surrounding said outer gear teeth of said pinion and having inner gear teeth which mesh with said outer gear teeth, said speed change gear being characterized in that:

said pinion having a plurality of through holes, each through



hole being formed in a space between adjacent pin holes thereof;

a support block arranged to permit a relative rotation to occur between said hub and said support block, having a plurality of column portions formed thereon and loosely inserted into said through holes of said pinion, and wherein the opposite ends of said block rotatably support said crakpins;

said through holes in said pinion and said column portion of the said support block including a first portion extending circumferentially and a second portion extending radially and inwardly from said first portion; and

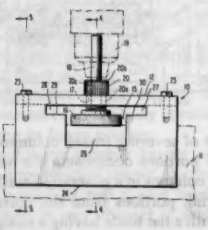
at least one bearing which is mounted between said support block and said hub so that the relative rotational movement of said support block and said hub is permitted.

4,348,919

ATTACHMENT AND METHOD FOR GRINDING AND FILING CHAIN SAW BARS

William E. Sherman, P.O. Box 95, Silver City, N. Mex. 88061

Filed Sep. 4, 1979, Ser. No. 72,425
Int. Cl.³ B23D *63/00*
U.S. Cl. 76—112 **11 Claims**



1. A chain saw bar grinding attachment comprising:

(a) a support member of L-shaped cross section including a first leg and a second leg;

(b) said first leg being arranged to engage one face of the chain saw bar when said attachment is employed for grinding the edge of the chain saw bar;

(c) said first leg including a first aperture through which a grinding wheel may extend;

(d) said second leg including a second aperture for receiving the shaft of the grinding wheel;

(e) an elongated plate connectable to said second leg and having a third aperture therein similar to said first aperture; and

(f) means for adjustably holding said plate in engagement with said second leg and in spaced relationship with said first leg for sliding engagement with the other face of the chain saw bar;

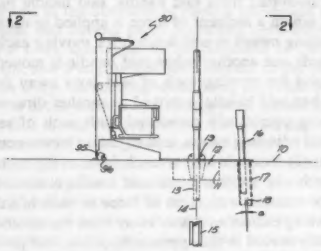
(g) said chain saw bar being receivable between said plate and said first leg when said attachment is employed for grinding the edge of the chain saw bar whereby said plate and said first leg provide guides slidably engaging opposite faces of chain saw bar.

4,348,920

WELL PIPE CONNECTING AND DISCONNECTING APPARATUS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Jul. 31, 1980, Ser. No. 174,154
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.25 **15 Claims**



1. A well tool comprising:

two parallel tracks adapted to extend along a rig floor at opposite sides of a rotary table opening;

a carriage having wheels engaging said tracks and movable therealong to guide the carriage for movement between a central position at the location of said rotary table opening, a mousehole position offset in one direction from said central position, and a retracted position offset in the opposite direction from said central position;

motor means for driving at least one of said wheels to move the carriage between said three positions thereof;

vertical guides carried by said carriage;

a mounting structure having rollers engaging said vertical guides and adapted to roll therealong to guide said structure for upward and downward movement relative to the carriage;

power means for moving said structure upwardly and downwardly relative to the carriage;

a torque wrench carried by said structure for upward and downward movement therewith and for movement along said tracks with the carriage and adapted to apply torque to make or break threadedly connected pipe sections at said central and mousehole positions of the carriage;

a spinner mounted to said structure above the torque wrench and for movement with the structure and upwardly and downwardly relative to it and the torque wrench; and

power actuated means for moving at least one of said rollers carried by said structure relative to the structure in a direction pivoting the structure and carried torque wrench and spinner about the axis of another of said rollers carried by the structure and between a position in

which an axis of the torque wrench and spinner is disposed directly vertically and a position in which said axis is disposed at a slight angle relative to the true vertical for engaging a pipe section at said mousehole location.

4,348,921

OPEN END WRENCH

Anthony D. White, Apartment GLH, 254 Park Ave. South, New York, N.Y. 10010

Filed Sep. 12, 1980, Ser. No. 186,488
Int. Cl.³ B25B *13/28*
U.S. Cl. 81—91 C **51 Claims**

1. A wrench comprising a handle, a first jaw and a second jaw, each said jaw having an axis along which a moment of force is transmitted from said handle, said handle having an axis along which a moment of force is applied to each of said jaws, adjusting means in said wrench for moving each of said jaws towards one another when said handle is moved in one direction and for moving each of said jaws away from one another when said handle is moved in another direction, said handle being operatively associated with each of said jaws through said adjusting means, said adjusting means comprising (1) a pivot; (2) means in said wrench for moving each of said jaws towards one another when said handle is moved in one direction to transmit a moment of force to each of said jaws, and for moving each of said jaws away from one another when said handle is moved in the opposite direction, said pivot being at a fixed point when said jaws are moved toward and away from one another by moving said handle; and (3) plate means for holding said jaws, said first jaw being pivotally secured to said plate means by means of a first pivot operatively associated with said first jaw, the longitudinal axis of said first pivot being transverse to the direction in which said handle is moved, said second jaw being pivotally secured to said plate means opposite said first jaw by means of a second pivot operatively associated with said second jaw and intermediate the ends thereof, the longitudinal axis of said second pivot being transverse to the direction in which said handle is moved, said handle being pivotally secured to said plate means by a plate pivot, the longitudinal axis thereof being transverse to the direction in which said handle is moved, said handle extending to jaw engaging means for engaging and pivotally moving each of said jaws when a moment of force is applied to said handle.

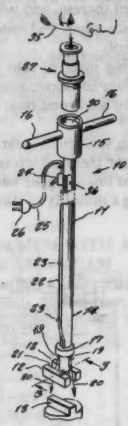
4,348,922

STOP BOX PEAK LIGHT

Albert Harris, 19669 Hull St., Detroit, Mich. 48203, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jul. 7, 1980, Ser. No. 166,033
Int. Cl.³ B25B *13/58*
U.S. Cl. 81—180 R **2 Claims**

1. A key wrench for a stop box, comprising in combination a pipe having spaced apart jaws at its lower end for grasping a crosshead of a valve therebetween, illumination means on said wrench being located near said jaws, a magnifying unit upon an upper end of said wrench, and cross handles near said upper



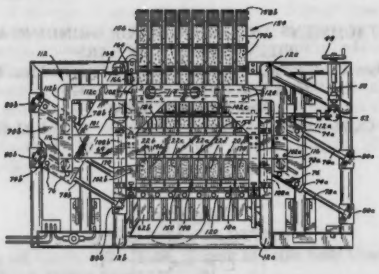
end for turning said wrench, wherein said illumination means comprises lamps aligned with a slot between said jaws.

4,348,923

METHOD FOR SEVERING PORTIONS FROM A PLURALITY OF FROZEN COLUMNS OF FISH OR THE LIKE

Larry Huston, Buffalo; Clifton H. Morrison, St. Paul; Glenn Rasmussen, Champlin, and Takuzo Tsuchiya, Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 43,978, May 31, 1979, Pat. No. 4,299,150.
This application Jun. 22, 1981, Ser. No. 276,145
Int. Cl.³ B26D *3/20, 1/06, 7/06*
U.S. Cl. 83—23 **6 Claims**



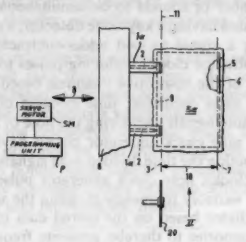
1. A method of severing frozen columns of fish or the like into individual portions comprising the steps of arranging a number of said columns in a generally parallel relation at a first location, severing portions from the corresponding ends of each column with a flat blade having a straight knife edge, said severing step including the angular advancing of said blade while maintaining said knife edge generally parallel to said columns, and moving said severed portions from said first location to a second location in the same relation in which said portions are oriented when severed in said first location.

4,348,924

METHOD AND APPARATUS FOR TRIMMING LAMINATES

Erwin Jenkner, Lindenstrasse 13, D-7261 Gechingen, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,688
Claims priority, application Switzerland, Apr. 14, 1980, 2845/80
Int. Cl.³ B27B 5/00
U.S. Cl. 83—39 9 Claims



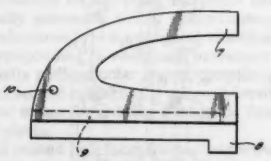
6. A method of manipulating a laminated workpiece of the type having at least two layers, one of which extends laterally beyond an edge face of the other layer, comprising the steps of moving the edge face of the other layer in contact with a mobile reference surface disposed between and spaced apart from a pair of jaws; moving at least one of said jaws to couple the workpiece to the reference surface while the latter continues to remain in contact with the edge face of the other layer; and moving the reference surface and the workpiece to at least one predetermined position.

4,348,925

CIRCULAR SAW SAFETY PUSHER DEVICE

Jack Manweiler, 1407 Laster Ave., Anaheim, Calif. 92802

Filed May 4, 1981, Ser. No. 260,372
Int. Cl.³ B27B 25/10
U.S. Cl. 83—435.1 1 Claim



1. A safety pusher device to aid in the cutting of wood pieces by a circular saw comprising:

(a) an elongated pusher handle member;

(b) an elongated insert member;

(c) said elongated pusher handle member having an upper gripping portion and a lower body portion provided with a channel along its lower portion;

(d) said elongated insert member having an extension portion along its upper portion shaped to conform to channel in said body portion of said pusher handle member and slidably received in said channel of said pusher handle member; and

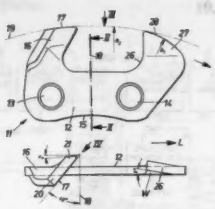
(e) said insert member is L-shaped comprising an elongated body supporting said extension portion and depending a block portion so that said block portion contacts and pushes a wood piece to be cut by said circular saw.

4,348,926

SAW CHAIN FOR MOTOR CHAIN SAWS

Hans Dolata, Waiblingen; Werner Meyle, Murr, and Günther Weyda, Waiblingen-Hohenacker, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 193,898
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940406
Int. Cl.³ B27B 33/14
U.S. Cl. 83—833 7 Claims



1. A saw chain, for motor chain saws, having a plurality of cutting tooth members, each of which comprises:

a base body;

a depth limiter or gauge; and

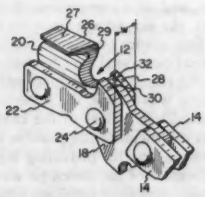
a cutting tooth arranged behind said depth limiter when viewed in the direction of cutting movement of said saw chain, said cutting tooth projecting outwardly from said base body transverse to the direction of cutting movement, and being twisted with respect to the plane of said base body, said cutting tooth being provided with a transverse cutter formed by a cutting back surface and an outer surface of said twisted cutting tooth, said depth limiter for automatically post-sharpening in common with said cutting tooth to the same extent during movement of said saw chain being bent laterally out of the plane of said base body and forming with this plane, when viewed in the direction of cutting movement, a rearwardly open, acute chamfered angle such that during post-sharpening there occurs a type of drawing or pulling grinding procedure in common over collective width of said cutting tooth and said depth limiter uniformly and accurately in one operation.

4,348,927

SAFETY SAW CHAIN

Jaroslav J. Olmr, Columbia, S.C., assignor to Textron Inc., Providence, R.I.

Filed Dec. 15, 1980, Ser. No. 216,150
Int. Cl.³ B27B 33/14
U.S. Cl. 83—833 9 Claims



1. In an endless safety saw chain for cutting wood including a plurality of center links and a plurality of pairs of side links pivotally joining said center links and defining a saw chain width with certain of said side links being cutter links, the improvement comprising a depth gauge means associated with said cutter links having a coincident facial area for engaging the wood substantially equal to the saw chain width.

4,348,928

ELECTRONIC MUSICAL INSTRUMENT

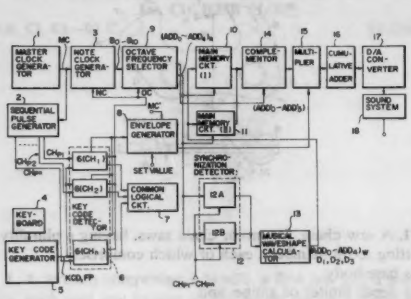
Noriji Sakashita; Toshio Kugisawa; Hironori Watanabe, and Hiroshi Kitagawa, all of Hamamatsu, Japan, assignors to Kabushiki Kaishi Kawai Gakki Seisakusho, Japan

Filed Sep. 19, 1977, Ser. No. 834,427

Claims priority, application Japan, Sep. 24, 1976, 51-114505; Sep. 24, 1976, 51-114506; Sep. 24, 1976, 51-114507; Sep. 24, 1976, 51-114508; Sep. 27, 1976, 51-115599; Sep. 27, 1976, 51-115600; Sep. 27, 1976, 51-115601; Sep. 27, 1976, 51-115602

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **3 Claims**



1. An electronic musical instrument for digital processing having a tone control in which required musical waveshape data are computed to obtain a complex waveshape, a keyboard having key switches on which a musical note having a frequency and a period is selected by closure of a key switch, and in which the complex waveshape is read out by a read-out frequency of the selected note to produce the selected musical note, the electronic musical instrument comprising:

a calculator coupled to the tone control for calculating the musical waveshape in association with the operation of the tone control in a period of time independent of the period of the selected musical tone;

a read out signal generator for generating a memory read-out signal based on the closure of the key switch;

a period detector for detecting the read-out signal period resulting from the closure of the key switch;

first and second memories storing the musical waveshape from the calculator and read out by the read-out signal; and

means for controlling the first and second memories to be written into and read out alternately with each other so that while the first memory is read out by the read-out signal, the musical waveshape from the calculator is written into the second memory, the read out operation is then switched to the second memory by a signal from the period detector in synchronism with the period of the musical note, and after completion of the read out of the first memory, the waveshape from the calculator is written into the first memory while the second memory is read out by the read-out signal, and further comprising:

a memory having stored therein quantized amplitude values of an envelope waveshape, the different values between successive amplitude values of the envelope waveshape, and sign bits representing the positive or negative of the difference values, and for providing high-order and low-order count values of the envelope waveshape, an envelope waveshape generator provided with a high-order and a low-order envelope counter for executing at all times and read-out of said memory; a coincidence circuit for detecting the coincidence between the count value of the high-order envelope counter and an address signal of the memory; a gate circuit opened by a coincidence signal from the coincidence circuit; a first multiplier having two inputs, the amplitude values stored in the memory being applied to one input of the first multiplier and a multiplier value dependent on the number of bits of the low-order envelope counter being applied to the other input of the first multiplier; a second multiplier having two inputs, the difference values stored in the memory being applied to one input of the second multiplier and the count value of the low-order envelope counter being applied as a multiplier value to the other input of the second multiplier; an adder-subtractor clock, the outputs from the first and second multipliers being applied to the adder-subtractor clock; a plurality of channels corresponding to the maximum number of sounds to be simultaneously produced, each channel having a key-code detector; a main oscillator providing a signal to said adder-subtractor clock, said adder subtractor clock producing pulses to the key code detectors of the respective channels based on the signal from the main oscillator; time division clocks for time dividing note signals identifying the note of the closed key switch; a note clock generator circuit having a decoder for distributing the time divided note signals from the time division clocks; note clock generator pulsed by said decoder for variably frequency-dividing the signal from the main oscillator based on the stored data of the first and second memories to thereby generate frequencies within desired sound ranges in a sample period of the musical waveshape written in the first and second memories and read out therefrom, and gate circuit means for gating output signals from the note clock generators for addition or subtraction depending upon the sign bits being positive or negative.

4,348,929

WAVE FORM GENERATOR FOR SOUND FORMATION IN AN ELECTRONIC MUSICAL INSTRUMENT

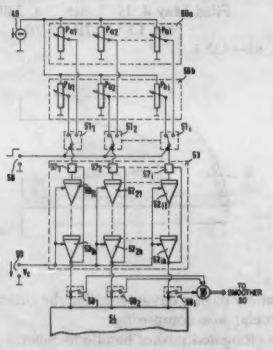
Rainer J. Gallitzendörfer, Hochstrasse 8, Karlsfeld, Fed. Rep. of Germany

Filed Jun. 23, 1980, Ser. No. 162,310

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926548

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **17 Claims**



1. A wave form generator providing a signal useful for sound formation in an electronic musical instrument, said generator comprising:

a storage unit having a plurality of portions each storing scanning values corresponding to predefined sequential scanning points of a different predetermined wave form;

a set of storage cells in each of said storage unit portions, each cell in a set storing the scanning value at a corresponding scanning point of the wave form of the corresponding storage unit portion;

switching means having for each scanning point a corresponding output and a corresponding plurality of inputs, each input of said plurality being associated with a differ-

ent wave form by being connected to a different storage unit portion at a storage cell corresponding to the scanning point of the respective switching means output, and means for selectively connecting one input of each plurality to the respective output;

interpolation means for providing transition values between successive scanning values of the same switching means output for each switching means output thereby providing interpolation between different wave forms;

smoothing unit means for providing intermediate values between the scanning values of different switching means outputs, thereby providing smoothing for each wave form; and

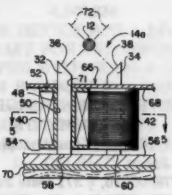
means for combining said scanning values, said intermediate values and said transition values, the scanning values being combined in the sequence of the respective scanning points, the intermediate values being inserted in sequence between the respective scanning points between which they are provided by said smoothing unit means and the transition points being inserted in sequence between the respective scanning values between which they are provided by said interpolation means.

4,348,930

TRANSDUCER FOR SENSING STRING VIBRATIONAL MOVEMENT IN TWO MUTUALLY PERPENDICULAR PLANES

Dennis A. Chobanian, P.O. Box 3067, Eldorado Springs, Colo. 80025, and R. Alan McNaughton, Rte. 1, Golden, Colo. 80401

Filed Jan. 25, 1980, Ser. No. 115,267
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.15 **15 Claims**



1. A transducer for a stringed instrument having at least one magnetically permeable string, said transducer being of the variable reluctance type for obtaining electrical signals respectively corresponding to vibrational movement of the string in two mutually perpendicular planes, comprising:

first and second magnetically permeable pole pieces;

magnetic means for creating a magnetic flux in each of said pole pieces;

first and second pole faces formed respectively on said first and second pole pieces, each said pole face for emanating magnetic flux from the pole piece upon which said pole face is formed;

support means for supporting and positioning said first and second pole pieces relative to the string, said support means positioning said pole faces in stationary predetermined positions relative to said string under non-vibratory conditions, said support means also positioning said first pole face from said string at a predetermined distance at which vibratory motion of said string in a first plane toward and away from said first pole face changes the magnetic flux in said first pole piece by a substantially greater amount than any change in the magnetic flux in said second pole piece, said support means also positioning said second pole face from said string at a predetermined distance at which vibratory motion of said string in a second plane toward and away from said second pole face changes the magnetic flux in said second pole face by a substantially greater amount than any change in magnetic flux in said first pole piece, said support means further positioning both pole faces in a predetermined configuration by which vibratory motion of the string in the first plane is substantially perpendicular to vibratory motion of the string in the second plane, said support means including said magnetic means,

means associated with said first pole piece for supplying a first electrical signal related to the change in flux in said first pole piece; and

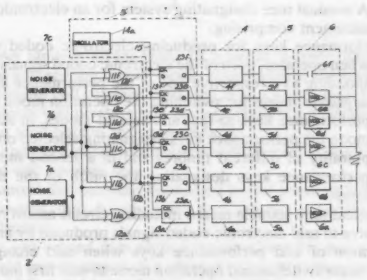
means associated with said second pole piece for supplying a second electrical signal related to the change in flux in said second pole piece.

4,348,931

SIMULATING WIND NOISE IN ELECTRONIC ORGANS USING DIGITAL NOISE GENERATORS

David R. Wade, Cincinnati, Ohio, assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Apr. 21, 1980, Ser. No. 142,381
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **26 Claims**



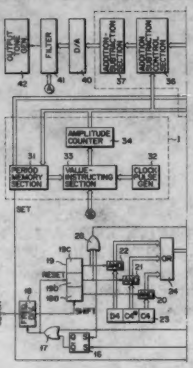
1. In an electronic musical instrument of the type having tone generator means for producing a continuous oscillating output signal having a relatively stable nominal frequency from which other tones of a lesser frequency may be derived and means for frequency modulating said output signal in accordance with a noise modulating signal, the improvement in combination therewith comprising means connected to said tone generator means for generating said modulating signal, said modulating signal generating means comprising a digital noise source producing an output signal having digital noise pulses of substantially constant amplitude and varying pulse width, said noise source comprising a plurality of digital noise generators producing output signal pulses of substantially constant amplitude but varying pulse width, means comprising a plurality of exclusive OR gates each having a pair of inputs and an output for mixing said digital noise generator output signal pulses to produce said digital noise source output signal, each of said digital noise generator output signals being connected to at least one different exclusive OR input, at least one of said exclusive OR outputs being connected to a different one of said exclusive OR inputs, some at least of said exclusive OR outputs forming the digital noise source output signals, and filtering means for limiting the frequency band of said noise source output signal to produce said noise modulating signal, said noise modulating signal causing substantially random perturbation in the frequency of said tone generator means output signal.

4,348,932

MUSICAL INSTRUMENT TYPE-SELECTING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 15,748, Feb. 27, 1979, abandoned. This application Nov. 25, 1980, Ser. No. 210,286
Claims priority, application Japan, Mar. 14, 1978, 53/29378
Int. Cl.³ G10H *1/057, 1/12*
U.S. Cl. 84—1.19 8 Claims



1. A musical tone designating system for an electronic musical instrument comprising:

performance keys for producing electronic coded signals when operated, each of the electronic coded signals corresponding to a respective one of the performance keys;

changeover means for switching the operation mode of said performance keys to first and second modes, in said first mode the performance keys designating selected ones of a plurality of different timbres and in a second mode the performance keys designating the pitch of the musical tones;

musical tone settable means including circuit means responsive to said electronic coded signals produced by an operation of said performance keys when said changeover means switches said operation mode to said first mode, for setting conditions corresponding to one of said plurality of different timbres; and

musical tone producing means responsive to said electronic coded signals produced by an operation of said performance keys when said changeover means switches said operation mode to said second mode, for producing musical tones corresponding to the conditions set in said musical tone settable means and corresponding to the pitch designated by operation of said performance keys.

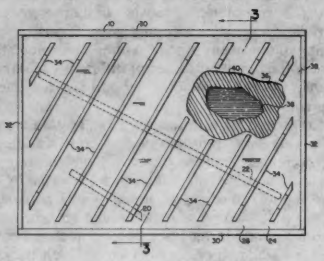
4,348,933

SOUNDBOARD ASSEMBLY FOR PIANOS OR THE LIKE

Charles H. Kaman, Farmington, and Robert J. Mayerjak, Torrington, both of Conn., assignors to Currier Piano Company, Inc., Marion, N.C.

Filed Oct. 9, 1980, Ser. No. 195,416
Int. Cl.³ G10C *3/06*
U.S. Cl. 84—193 16 Claims

1. In a piano or similar stringed instrument, the combination comprising: a soundboard assembly with two major parallel soundboard faces, and an elongated bridge which engages one of said soundboard faces of said assembly to transmit vibrations of associated strings thereto, said soundboard assembly comprising a soundboard consisting of a center single sheet of wood, and two outer layers of composite material each bonded to a respective one of the opposite faces of said center sheet and each providing a respective one of said soundboard faces, and a plurality of generally parallel spaced ribs secured to said soundboard in engagement with said face thereof opposite said face engaged by said bridge, said ribs being arranged at an angle of between 30° and 90° to said bridge, said center sheet of wood of said soundboard having a grain with a generally uniform direction throughout said sheet and which grain direc-



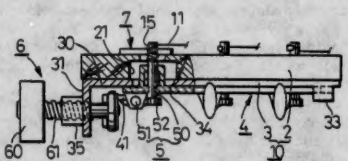
tions is arranged at an angle of between 30° and 90° to said ribs, and each of said two outer layers of composite material consisting substantially solely of a plurality of unidirectional carbon fibers embedded in a resin matrix and which carbon fibers are oriented at an angle of between 30° and 90° to said grain direction of said center sheet of wood.

4,348,934

TUNING DEVICE FOR STRINGED MUSICAL INSTRUMENTS

Saburo Ogata, 2-11, Shonai Higashimachi 4-chome, Toyonaka-shi, Osaka 560, Japan

PCT No. PCT/JP78/00016, § 371 Date Jun. 25, 1980, § 102(e) Date Jun. 25, 1980, PCT Pub. No. WO80/01013, PCT Pub. Date May 15, 1980
PCT Filed Oct. 31, 1978, Ser. No. 198,956
Int. Cl.³ G10D *3/14*
U.S. Cl. 84—306 5 Claims

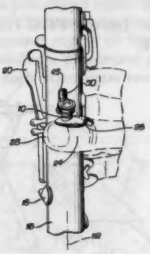


1. A tuning device for a stringed musical instrument comprising a movable support (4) supported by the head (10) of the instrument and reciprocally movable along strings (11), string winding assemblies (5) mounted on the movable support (4) and each having a string winding pin (50) for winding an end of the string thereon, and a reciprocating assembly (6) provided between the head (10) and the movable support (4) for forcibly moving the movable support (4), the string winding pin (50) being formed with a string insertion bore (54), a holding portion (55) provided by an enlarged opening of the insertion bore and a string engaging groove (56) formed in the surface of the pin and communicating with the insertion bore (54), the string end having attached thereto a holder (15) engageable with the holding portion (55).

4,348,935
THUMB REST FOR WOODWIND MUSICAL INSTRUMENTS

Charles L. Bay, 1285 Brookview Ave., Westlake Village, Calif. 91361

Filed May 1, 1980, Ser. No. 145,717
Int. Cl.³ G10D *3/18*
U.S. Cl. 84—380 R 7 Claims

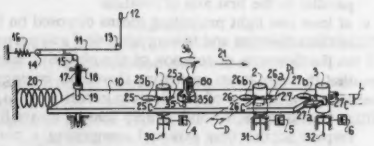


1. In a woodwind musical instrument wherein at least a portion of the weight of the instrument is supported by a thumb of the player through a thumb rest, the improvement comprising a concave thumb support plate portion of the thumb rest shaped to conform to the lateral curvature of the player's thumb, said support plate having its concave shape prior to contacting the player's thumb.

4,348,936
SAFETY RELEASE DEVICE FOR A LOAD SUSPENDED FROM AN AIRCRAFT FOR TRANSPORT AND CHARGE EQUIPPED WITH SUCH A DEVICE

Noël Fulchiron, and Bernard Naillon, both of Paris, France, assignors to "Thomson-Brandt", Paris, France

Filed May 20, 1980, Ser. No. 151,668
Claims priority, application France, May 23, 1979, 79 13200
Int. Cl.³ B64D *1/04*
U.S. Cl. 89—1.5 D 5 Claims



1. A safety device for a munition suspended beneath an aircraft, said safety device comprising:

a sliding bar movable between a first position and a second position;

first blocking means for locking said bar in said first position;

cable release means connected between said aircraft and said first blocking means for actuating the release of said first blocking means;

at least one suspending ring engageable with a hook integral with said aircraft;

second blocking means mechanically connected to said at least one ring for locking said bar in said first position when said at least one ring is engaged with said hook;

at least two apertures in said sliding bar, each of said apertures having first and second cross sections;

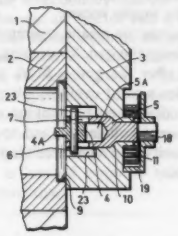
a fuse lock engageable with each of said apertures, each said fuse lock including a first rectangular cross section portion engageable with said first cross section of one of said apertures when said sliding bar is in said first position for maintaining said fuse lock in a safety position and a second circular cross section engageable with said second cross section of said one of said apertures when said sliding bar is in said second position for releasing said fuse lock into an armed position,

whereby said fuse locks are released into an armed position only when said release means is actuated and said at least one ring is disengaged from said hook.

4,348,937
IGNITION ARRANGEMENT FOR AMMUNITION IN A BARREL WEAPON

Hans Kuffer, Obertraubling, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,575
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949218
Int. Cl.³ F41D *11/16*
U.S. Cl. 89—24 7 Claims



1. An ignition arrangement in a barrel weapon having a sliding wedge-type breech block, comprising in combination,

a pressure bolt rotatably mounted in said wedge-type breech block; said pressure bolt having cylindrical walls defining an axial bore in the pressure bolt;

a firing pin coaxially slidably movably mounted in said bore of said pressure bolt;

a control disc coaxially connected to said pressure bolt, said control disc having first and second cams disposed thereon;

first and second cam surface means adjustably mounted in said barrel weapon and adapted to operatively coact with said first and second cams respectively;

biasing means connected to said control disc adapted to move between a biased and unbiased position;

whereby said biasing means bias said control disc in such a way during the opening movement of said wedge-type breech block that said first cam of said control disc is contacted by said first cam surface means and is thereby rotationally biased against the action of said biasing means and the firing pin is retracted from the gun barrel due to the rotation imparted on the pressure bolt by the control disc; whereas during the closing movement of said wedge-type breech block said second cam of said control disc coacts with said second cam surface means to retain said control disc in a predetermined angular position until the axis of the firing pin coincides with the axis of the gun barrel, so that only then the biasing means are fully released to move their unbiased position and thereby propel the firing pin forwardly into the barrel of the weapon.

4,348,938
TWO STAGE SHELL FEEDING APPARATUS WITH SHELL FEEDING PATH CONTROL

Richard R. Gillum, Marblehead, Ohio, assignor to ARES, Inc., Port Clinton, Ohio

Filed Oct. 30, 1979, Ser. No. 89,308
Int. Cl.³ F41D *10/04*
U.S. Cl. 89—33 BA 31 Claims

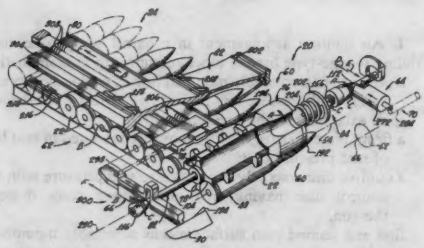
1. Shell feeding apparatus for an automatic gun having a

shell supply means for containing shells to be fed into the gun and a bolt operative for axially reciprocating past a shell pick up position and picking up shells therefrom on forward bolt travel for loading into a gun firing chamber, the apparatus comprising:

(a) first stage shell feeding means for transferring shells from the shell supply means to the shell pick up position, said first stage feeding means including a shell rotor rotatably mounted on an axial rotor shaft, said shell rotor having surface regions defining a plurality of equally spaced apart, peripheral shell holding cavities;

(b) means for bidirectionally rotatably mounting the rotor shaft between the shell supply means and the shell pick up position, said mounting means positioning the shell rotor means relative to the shell supply means and the pick up position for causing, when any one of the rotor cavities is indexed into the shell pick up position, another one of the rotor cavities to be positioned in shell receiving relationship with the supply means;

(c) first stage actuation means, operated by pressurized gases caused by firing the gun, for causing, as the bolt is moving rearwardly after the gun is fired, partial rotation of the rotor to index a rotor cavity holding a shell into the shell pick up position to enable picking up of the shell by the bolt on forward bolt travel, and to simultaneously index an empty cavity into shell receiving relationship with the supply means;



said first stage actuating means including a first crankarm fixed to a first end of the rotor shaft, a gas cylinder having a piston connected to said crankarm for causing pivotal crankarm movement in response to piston movement and means for supplying pressurized gas from the gun barrel to the cylinder;

(d) second stage feeding means, operated by pressurized gases caused by firing of the gun, for causing, after the first stage feeding means has rotatably indexed the rotor and before a next firing of the gun, transfer of a shell from the shell supply means into the empty rotor cavity indexed therewith, said second stage feeding means including spring loaded shell advancing means connected to the shell supply means;

(e) second stage actuation means for actuating said second stage feeding means, including a second crankarm fixed to a second end of the rotor shaft and means for interconnecting the second crankarm with the shell advancing means to enable compressing of springs in the shell advancing means in response to pivotal movement of the second crankarm; and,

(f) racheting means interconnecting the rotor with the rotor shaft for limiting rotational movement of the rotor to a single rotational direction, thereby enabling return rotation of the rotor shaft without rotational movement of the rotor.

4,348,939

MECHANICAL-OPTOELECTRONIC ANGLE COMPARATOR FOR DETERMINATION OF THE ANGULAR POSITION OF A WEAPON MOUNTED BY A COMBAT VEHICLE RELATIVE TO THE LINE OF SIGHT

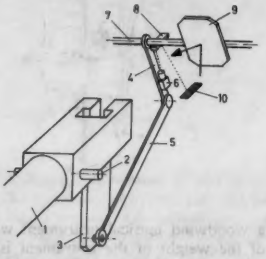
Johann F. Hipp, Hamburg, Fed. Rep. of Germany, assignor to Wegman & Co., Kassel, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,108

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2927037

Int. Cl.³ F41G *1/30*

U.S. Cl. 89—41 ME **6 Claims**



1. A mechanical-optoelectronic angle comparator for determining the angular position relative to the line of sight of a weapon mounted on a combat vehicle having a sighting device comprising an objective mirror which pivots on a first axis that is parallel to the axis of rotation of the weapon, the comparator comprising:

a. means for mechanically transmitting the angular position of the weapon comprising an intermediate member and means mounting same perpendicular to the axis of rotation of the objective mirror for pivotal movement about an axis of rotation coinciding with the first axis of rotation of the objective mirror and independent of the movement of the objective mirror;

b. at least one deflecting mirror rigidly connected with the objective mirror to dispose the reflecting surface thereof parallel to the first axis of rotation;

c. at least one light projecting means disposed on the intermediate member and having an optical axis perpendicular to the first axis of rotation of the objective mirror such that the light beam emanating therefrom impinges on the reflecting surface of a deflecting mirror;

d. at least one electro-optical light sensing means fixed with respect to the first axis and comprising a plurality of aligned light-sensitive regions disposed such that within a predetermined range of angular positions of the intermediate member relative to the deflecting mirror there is at all times at least one light-sensitive region of the sensor field on which the light beam reflected by the deflecting mirror impinges; and

e. means receptive of the output of the optical sensing means for electronically evaluating the region on which light impinges.

4,348,940

SERVO-RELEASE MECHANISM FOR AN AUTOMATIC WEAPON

Clemens Bremer, and Walter Klumpp, both of Duesseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 28, 1979, Ser. No. 63,388

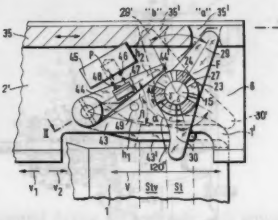
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833976

Int. Cl.³ F41D *11/02*

U.S. Cl. 89—140 **26 Claims**

1. In a gun having a trigger, a servo-release mechanism for

the trigger, and a breech movable along a guide path in a rearward, recoil direction and a forward counter-recoil direction, said guide path for the breech having a precontrol region, and a control region rearwardly of the precontrol region, the improved servo-release mechanism which comprises a disengageable coupling having first and second coaxial parts, the confronting ends of the first and second parts of the coupling each having a reference surface normal to the axis of the coupling and locking surfaces adaptable to interlock with each other, means forming a precontrol signal upon a "stop firing" signal and the passage of the breech moving in the recoil direction through the precontrol region of the guide path of the breech, means for providing a precontrol position of the coupling parts relative to each other upon receiving a precontrol



signal, said precontrol position being caused by a restoring force generating a first change in the relative axial positions of the first and second parts of the coupling, in said precontrol position of the coupling the reference surfaces thereof having sliding contact with each other, means for removing the first and second parts of the coupling from engagement with each other upon counter-recoil motion of the breech and its passage through the control region and upon the presence of a defined relative angular position of the two parts of the coupling so that they may interlock with each other, and means for providing by a relative axial movement of the first and second parts toward each other a locking position of the coupling in which full surface engagement between the locking surfaces of the first and second coupling parts takes place with a consequent loss of contact between the reference surfaces thereof.

4,348,941

SHOULDER ARM WITH SWIVEL BREECH MEMBER

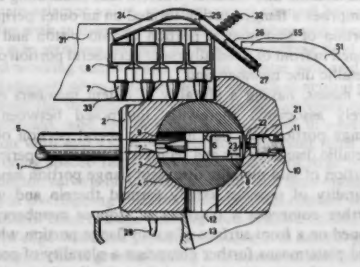
Dieter Ketterer; Horst Jakubaschk, both of Oberndorf, and Emil Rommel, Dornhan, all of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Continuation of Ser. No. 21,314, Mar. 16, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,970

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813633

Int. Cl.³ F41D *10/20*

U.S. Cl. 89—155 **15 Claims**



1. In a shoulder arm, especially a rifle, having a barrel, a recess, extending perpendicular to the axis of said barrel, formed in a member which is fixedly connected with said barrel, and a roller-shaped breech member coaxially arranged in said recess and capable of being swivelled about its longitudinal axis for loading, said breech member containing a firing chamber which is designed symmetrically to a transverse center plane and is capable of assuming two firing positions separated from one another by a 180° rotation of said breech member and which, in each said firing position of said breech member, is in alignment with said barrel and is closed to the rear, and further having an arrangement for swivelling said breech member out of said firing positions and into a loading position in which said firing chamber is accessible for the introduction of a cartridge; and wherein said recess is designed in the form of a cylindrical hole whose wall serves to mount said roller-shaped breech member and to directly close said firing chamber when it is located in said firing position, said breech member is retained in its respective position by means of said swivelling arrangement, and said breech member can only be rotated in one direction by said swivel arrangement; the improvement wherein: an ejector and a magazine are arranged on the same side of the weapon, above said barrel, and in an operative position with said firing chamber when it is in said loading position; the loading end, which introduces the cartridges into said firing chamber in the breech member, of a loading lever acts outside the center of the cartridge and leaves said center of the cartridge free; said ejector is arranged in the center plane and swivels into an attitude, under the force of a spring, in which it is located opposite said firing chamber should there be no cartridge.

4,348,942

PRESSURE-MEDIUM CONNECTION BETWEEN A VALVE BLOCK AND A LOAD WHICH HAS AT LEAST ONE DOUBLE-ACTING PRESSURE-MEDIUM MOTOR

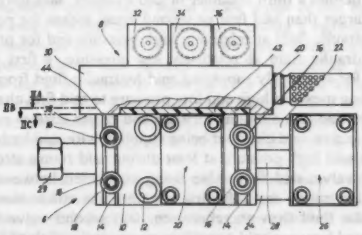
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Neckar, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,602

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933704

Int. Cl.³ F15B *13/00*

U.S. Cl. 91—54 **6 Claims**



1. A pressure-medium connection between a valve block and a load which has at least one double-acting pressure-medium motor, including two connecting openings constructed in the valve-block housing for the pressure-medium motor, two connecting openings constructed in the load housing for the pressure-medium motor and including a sealing plate which has openings through which the connecting openings of the valve-block housing can be connected to the connecting openings of the load housing, the improvement comprised wherein

(a) the connecting openings of the valve-block housing are offset with respect to the connecting openings of the load housing; and

(b) the openings of the sealing plate are constructed as control channels which extend in the plane of the sealing plate, said channels in a first operating position of the sealing plate connecting the first connecting openings of

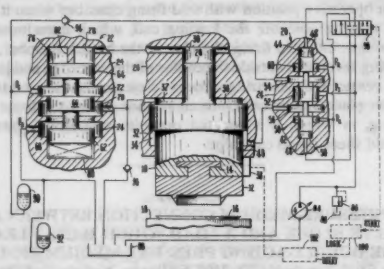
valve-block housing and load housing and the second connecting openings of valve-block housing and load housing and in a second operating position of the sealing plate connected the first connecting opening of the valve block housing to the second connecting opening of the load housing and the second connecting opening of the valve-block housing to the first connecting opening of the load housing.

4,348,943

HYDRAULIC PRESS APPARATUS

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics Inc., Henrietta, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,476
Int. Cl.³ F15B *11/15, 13/07*
U.S. Cl. 91—355 **21 Claims**



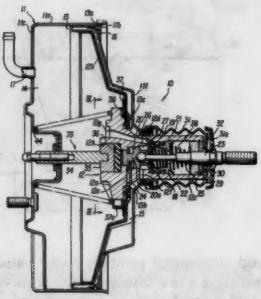
1. Hydraulic press apparatus which comprises a ram for applying force to a workpiece, a cylinder in which said ram is moveable along forward and return strokes toward and away from the workpiece, said ram having first and second opposed areas which define first and second chambers in said cylinder, said ram also having a third area opposed to said second area which defines a third chamber in said cylinder, said third area being larger than said first or second areas, means for providing hydraulic fluid at relatively high pressure and for providing hydraulic fluid at relatively low pressure, a first valve means for alternately supplying said hydraulic fluid from said providing means at high and low pressure to said first chamber to move said ram along its forward and return strokes respectively, said second chamber being supplied with said hydraulic fluid at said high pressure at least during said return stroke, a second valve, said first valve being connected between said providing means and said first chamber via connections for hydraulic fluid flow therebetween, said second valve being connected between said providing means and said third chamber via connections for hydraulic fluid flow therebetween, said first and second valves producing flow of said fluid at said high pressure into said first chamber and flow of said fluid at said low pressure into said third chamber to enable movement of said ram along said forward stroke, said second valve having hydraulic pressure responsive means for operating said valve to move at a velocity greater than said ram, said first chamber being connected to said second valve for supplying fluid from said first chamber to said pressure responsive means to operate such second valve when the pressure in said first chamber exceeds a certain magnitude during the portion of said forward strokes when said force is applied to said workpiece for supplying said third chamber with said high pressure fluid thereby increasing the force applied to said ram against said workpiece and also to provide for a short operating cycle for said press apparatus.

4,348,944

BRAKE BOOSTER

Chiaki Ochisi, Chiwyu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 20, 1980, Ser. No. 161,305
Claims priority, application Japan, Jun. 22, 1979, 54-84876[U]
Int. Cl.³ F15B *9/10*; F01B *19/00*; F16J *3/02*
U.S. Cl. 91—369 A **4 Claims**



1. A brake booster for operation and connection with a brake pedal, comprising:

a housing having an inner wall;

a diaphragm, an outer end portion thereof being secured to the inner wall of the housing;

a power piston movably disposed in the housing and airtightly connected to an inner end portion of said diaphragm to thereby divide an interior space of said housing into first and second compartments, wherein said power piston further comprises a central portion which comprises resin and a metallic disc member surrounding and connected to said central portion;

control valve means positioned within said power piston for generating a pressure difference between said first and second compartments in response to operation of said brake pedal;

connecting means for connecting said central portion and said metallic disc member wherein said connecting means comprises a flange portion formed on an outer peripheral portion of said central portion of said piston and positioned in front of a radially inner peripheral portion of said metallic disc member; and

plate means, having a plurality of detent members operatively associated therewith, interposed between said flange portion and said inner peripheral portion of said metallic disc member and secured to said inner peripheral portion of said metallic disc, said flange portion having a plurality of recesses axially formed therein and which further comprises a plurality of stopper members positioned on a front surface of a said flange portion wherein said plate means further comprises a plurality of projecting members respectively axially extending into said plurality of recesses and wherein said plurality of detent members respectively engage said plurality of stopper members.

4,348,945
DEVICE FOR CONTROLLING A HYDRAULIC POWER CIRCUIT

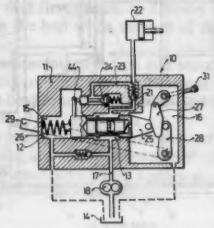
Werner Schuhmacher, Asperg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 928,412, Jul. 16, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 167,230

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737653

Int. Cl.³ F15B *13/042;* F16K *31/143*

U.S. Cl. 91—452 6 Claims



1. In a control device for hydraulic unit power circuit having a fluid supply source, a combination comprising a housing having a boring; a preselector valve arranged for reciprocating movement within said boring between a working position and a neutral position, opposite ends of said preselector valve being open to a pressure relieving space means; first spring means biasing said preselector valve within said housing, said housing defining within said boring a recessed pressure chamber and a control section associated therewith and having first and second control edges spaced apart from each other for a predetermined distance, said pressure chamber being associated with a pressure fluid supply conduit and with a working conduit, said preselector valve having a blind boring defining an annulus and being formed with a first annular groove having third and fourth control edges at each end thereof corresponding to the first-mentioned control edges, respectively and a second annular groove arranged within the range of said pressure chamber, said preselector valve having a bore for communicating said first groove with said blind boring, said second and fourth control edges being adjacent said recessed pressure chamber and said first and third control edges being adjacent said pressure relieving space means; a main selector valve arranged within said blind boring of the preselector valve for slidable movement therein; second spring means biasing said main selector valve, said main selector valve having an axial opening adapted to be connected to said pressure relieving space means in said housing; a first radial channel formed in said preselector valve between said second groove and said main selector valve; and a second radial channel formed in said main selector valve between said preselector valve and said axial opening of the main selector valve, said first radial channel being out of register with said second radial channel when said preselector valve is in working position to permit a working fluid to flow to said working conduit, and being in register with said second radial channel when said preselector valve is in neutral position to permit the working fluid to flow to said pressure relieving space means, said fourth control edge being in overlapping relation with said second control edge and said third control edge being spaced relative to said first control edge when the preselector valve is in working position, said third control edge being in overlapping relation with said first control edge and said fourth control edge being spaced relative to said second control edge when the preselector valve is in neutral position, said second radial groove having a thin annular bottom portion forming a part of said annulas and lateral end pressure responsive surfaces being so dimensioned as to produce extension and contraction of said bottom portion in axial direction within the limits of elastic deformability of a material of said preselector valve in response to pressure changes in said pressure chamber, said extension causing relative axial displacement and increased overlapping of said second and fourth control edges in the working position to prevent a tight choking.

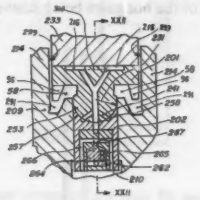
4,348,946
RADIAL PISTON MACHINE WITH FREE—FLOATING PISTON AND PISTON—SHOE ASSEMBLIES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan (240-01)

Division of Ser. No. 765,221, Feb. 3, 1977, Pat. No. 4,193,336, which is a continuation-in-part of Ser. No. 528,346, Nov. 29, 1974, Pat. No. 4,037,523. This application Nov. 19, 1979, Ser. No. 95,900

Int. Cl.³ F01B *13/06*

U.S. Cl. 91—489 2 Claims



1. A radial piston type fluid machine; comprising a housing means, a rotor member rotatable in said housing means about a rotor axis and formed with a plurality of angularly spaced and radially outwardly opening cylinders; a piston radially displaceable in each of said cylinders and having a piston head forming a reception-face of a configuration defined by a constant and permanent radius;

a piston shoe associated to each of said pistons and having a radially inwardly projecting portion provided partially with a configuration complementary to that of said reception face and with a radius equal to said radius of said reception face and able to radially engage the respective piston head of the respective piston and pivot thereon; said piston shoe further having end faces on the axial ends thereof; an actuator ring member radially of said rotor member, pistons and piston shoes; a pair of end elements located on one of said members having a radially plane innermost face on each of said elements and flanking said piston shoes; said radially inwardly projecting portions being at all times at least partially received within said cylinders and said pistons and piston shoes remaining radially moveably contained between said rotor member, said actuator ring member and said innermost faces of said elements,

wherein said pistons and piston shoes are not connected to each other, but wherein flow-through restriction means are provided in said piston for prevention of too much flow of fluid through said piston, and;

wherein said flow-through restriction means includes a pressure responsive portion, which is radially movable and able to partially open and close a respective passage.

4,348,947
SELF-CLEANING CHIMNEY STACK

John J. Carty, Rocky Point, N.Y., assignor to Luftek, Inc., Shoreham, N.Y.

Filed Jan. 21, 1981, Ser. No. 226,928

Int. Cl.³ F23L *17/02*

U.S. Cl. 98—58 5 Claims

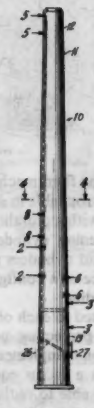
1. A double shell chimney stack capable of conveying hot gases that is self-cleaning by design comprising the following:

(a) an outer hollow structural column member;

(b) a hollow inner core member contained within said outer hollow structural column member, said hollow inner core

member consisting of an upper inner core member and a lower inner core member, said upper inner core member and said lower inner core member being separate and distinct independent structures with said upper inner core member receiving structural support from said outer hollow structural column member;

(c) a flexible seal joining said upper and lower portions of said hollow inner core member so as to permit the movement of said upper inner core member and said lower inner core member independent of each other while providing an air-tight seal between said upper inner core member and said lower inner core member so as to prevent the escape of hot gases being conveyed by said double chimney stack prior to said gases exiting at the top of said double shell chimney stack;

(d) means incorporated within the design of said hollow inner core member for selectively maintaining the temperature level of the hot gases being conveyed by said double

shell chimney stack at a predetermined point above the dew point of the acid vapors contained within said hot gases being conveyed so as to avoid the condensation upon the internal structure of said double shell chimney stack of said acid vapor contained within said hot gases;

(e) vibratory means affixed to the exterior surface of said hollow inner core member capable of selectively vibrating said hollow inner core member so as to dislodge therefrom as well as preventing the adhering thereto of particulate material; and

(f) means for generating between the air space defined between said hollow inner core member and said outer hollow structural member a selective pressure level that is greater than the pressure level within the center passageway of said double shell chimney stack so as to inhibit said hot gases being conveyed by said double shell chimney stack from coming into contact with any physical portion of said double shell chimney stack.

4,348,948

COOKING APPARATUS

Clint Allison, Wichita Falls, Tex., assignor to Hager and Allison Corp., Wichita Falls, Tex.

Filed Jan. 28, 1980, Ser. No. 116,050

Int. Cl.³ A21B *1/24;* A47J *37/04;* A23B *4/04*

U.S. Cl. 99—339 **12 Claims**

1. A cooking apparatus comprising:

means for producing heat and smoke,

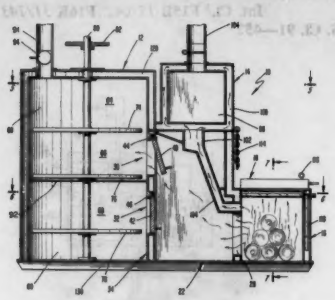
a smoke oven forming a cooking chamber therein,

a plurality of vertically spaced food support means disposed within said chamber for carrying food to be cooked,

means for rotating said food support means about a generally vertical axis,

heat shield means positioned beneath one of said food support means and above another of said food support means to retard the travel of heat to and from the space above said other food support means,

first and second vertically spaced openings in said chamber communicating with said heat and smoke producing



means to conduct heat and smoke into said chamber, said first opening communicating with said chamber at a first location above said heat shield and said second opening communicating with said chamber at a second location below said heat shield, and

adjustable gate means for opening and closing said openings independently of one another to independently regulate the passage of heat and smoke through said openings and into said chamber.

4,348,949

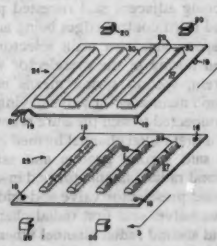
NON-SATURABLE BUN

George L. Selleck, 16-B Division St., Glens Falls, N.Y. 12801

Division of Ser. No. 583,806, Jun. 4, 1975, abandoned, which is a division of Ser. No. 30,764, Apr. 22, 1970, Pat. No. 3,908,022. This application Jul. 6, 1976, Ser. No. 702,828

Int. Cl.³ A21D *13/00;* A21B *3/13*

U.S. Cl. 99—426 **7 Claims**



1. Apparatus for baking a bun or the like of the type having a substantially liquid impermeable hard baked channel in its top surface for holding solid food and/or a liquid food substance, a relatively thinner crust on its bottom surface and a soft, smooth bread texture in its interior, said apparatus comprising:

first means defining at least one downwardly opening recess for forming the lower exterior of at least one bun said first means having a first downwardly facing surface extending beyond the boundaries of said recess,

second means defining at least one upwardly extending thin-walled protuberance for forming at least one hard baked channel, said second means having a second, upwardly facing surface extending beyond the boundaries of said protuberance, the underside of each said protuber-

ance being hollow for capturing heat to cause hard baking of the bun channel and to promote rising of the dough during operation of the apparatus,

means including spacers for positioning said second means in mating relation beneath said first means with each said protuberance extending upwardly at least partly into a corresponding recess in said first part and with a predetermined open spacing between said first and second surfaces,

means for applying heat to both sides of said first and second means in assembled mating relationship whereby said underside of each said protuberance of said second means is heated due to heat captured therein to a higher temperature than said first means, to thereby form a hard baked channel in the bun while the rest of the bun is baked less hard,

means for positioning said first and second means in assembled mating relationship a predetermined open spacing above the heat source included in said means for applying heat, and

means for preventing said first means and said second means from moving apart as the pressure of baking breads develops during operation of the apparatus.

4,348,950

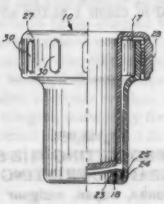
GARLIC PRESS

David P. Harris, 2523 S. Acoma, Denver, Colo. 80223

Continuation of Ser. No. 99,429, Dec. 3, 1979, abandoned. This application Dec. 19, 1980, Ser. No. 218,077

Int. Cl.³ B30B *9/02*

U.S. Cl. 99—510 **6 Claims**



1. A press for crushing herbs or the like comprising:

a rigid generally hollow cylindrical outer shell having a bottom portion defining a bottom opening and an enlarged externally threaded top portion defining a top opening of relatively larger diameter than said bottom opening, said top portion being integrally connected through a radius to said bottom portion;

a circumferential shoulder integrally connected to the bottom portion of said cylindrical outer shell, said shoulder being spaced from the interior surface of the bottom portion of the outer shell, said shoulder extending a relatively short distance upward from the bottom portion toward the top portion of said outer shell and defining an interior channel within said bottom portion;

a foraminous plate releasably connected to said shoulder by a downwardly extending peripheral flange extending downwardly into said channel;

a hollow cylindrical ram telescopingly received within the interior of said outer shell, a grinding surface defined on the circular bottom portion of said cylindrical ram, said grinding surface including shallow radially extending grooves over the surface thereof, said grinding surface having a diameter smaller than said circumferential shoulder and substantially equal to the diameter of the cylindrical ram; and

a cap integrally connected to and extending radially outward from the top of said cylindrical ram and having a depending skirt portion extending downwardly over the enlarged threaded top portion of said outer shell, said depending skirt portion further having raised ribs at equal arcuate locations around said cap and being internally threaded for threaded engagement with said threaded top portion of said shell, whereby an herb placed on the foraminous plate is crushed between said plate and the descending grinding surface of said ram as said cap is turned and juices contained in the herb are thereby squeezed out through the foraminous plate and the open bottom of said outer shell.

4,348,951

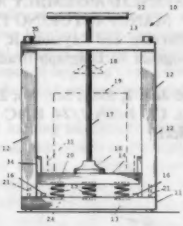
COTTAGE CHEESE PROCESSOR

Angelo F. LaPaglia, 7700 W. Bargain Rd., Erie, Pa. 16509

Filed Nov. 10, 1980, Ser. No. 205,883

Int. Cl.³ B30B *9/06*

U.S. Cl. 100—127 **4 Claims**



1. A cheese press comprising a base **11**, spaced uprights **12** attached to the base **11**, and extending upwardly therefrom, a cross member **13** attached to the uprights,

and a platen **14** between said uprights and above said base,

an upper stop **34** on each of the uprights above said platen limiting the upward movement of the platen and a lower stop adjacent each of the uprights spaced from said upper stops limiting the downward movement of the platen,

a screw **17** extending through said cross member and a plunger attached to said screw,

said base being adapted to be supported on a supporting surface,

a colander on said platen for receiving cheese material adapted to receive said plunger whereby liquid can be squeezed from said cheese,

springs on said base supporting said platen urging said platen into engagement with said upper stops,

the pressure on cheese by said plunger being adapted to compress said springs forcing said platen away from said upper stops whereby the pressure on said cheese is limited.

4,348,952

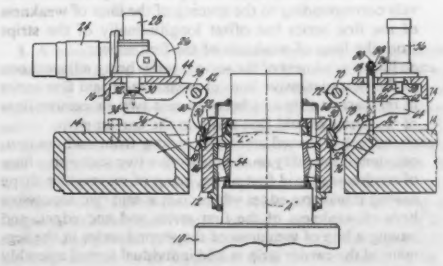
CROSS AXIS MECHANISM

Kendrick J. Gooch, Bethany, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Jan. 19, 1981, Ser. No. 226,189

Int. Cl.³ B30B *3/04*

U.S. Cl. 100—158 R **13 Claims**



1. A calender roll machine having a frame arrangement

within which at least a first and a second roll, is each rotatively journalled, said machine including:

a cross-axis means disposed at an end of at least said first roll, said cross-axis means permitting the axis of said first roll to be controllably skewed with respect to the axis of said second roll;

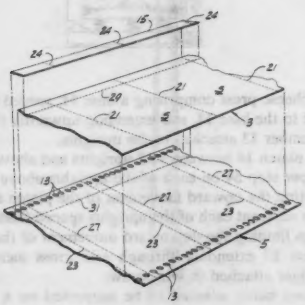
said cross-axis means comprising a primary mechanism and a secondary mechanism including cooperating levers diametrically arranged at opposite sides of a bearing disposed near the end of said first roll at least one of said levers being empowerable for skewing said first roll.

4,348,953

CONTINUOUS STENCIL ASSEMBLY AND METHOD OF MANUFACTURING IT

Jean R. Cole, Carterville, and Raymond R. Panaia, Carbondale, both of Ill., assignors to Diagraph-Bradley Industries, Inc., Herrin, Ill.

Filed Jan. 2, 1981, Ser. No. 222,179
Int. Cl.³ B41N *1/24*; B41C *1/14*
U.S. Cl. 101—128.21 **13 Claims**



1. A continuous stencil assembly comprising,

a continuous stencil strip of stencil material,

a continuous carrier strip carrying the stencil strip,

said stencil strip extending longitudinally of the carrier strip on one face of the carrier strip,

the stencil strip and the carrier strip each having a first series of lines of weakness extending transversely thereof spaced at stencil height intervals along the length of the strips with each of said lines of weakness of the first series in the stencil strip at least generally in register with a respective line of weakness of the first series in the carrier strip,

said strips being adapted to be torn on said lines of weakness of the first series for providing individual stencil assemblies each comprising the segment of the stencil strip and the segment of the carrier strip between two successive lines of weakness of the first series,

the carrier strip further having a second series of lines of weakness extending transversely thereof spaced at intervals corresponding to the spacing of the lines of weakness of the first series but offset longitudinally of the strips from the lines of weakness of the first series,

each line of weakness of the second series being adjacent one of the two successive lines of weakness of said first series in the carrier strip and between said two successive lines of weakness of said first series in the carrier strip,

each individual stencil assembly, as torn from said continuous stencil assembly on the respective two successive lines of weakness of said first series, being of rectangular shape having transverse edges where torn at said two successive lines of weakness of the first series and end edges, and having a line of weakness of the second series in the segment of the carrier strip in said individual stencil assembly adjacent one of said transverse edges, and

means securing the stencil strip to the carrier strip holding the said segments of the strips in each of said individual stencil assemblies together but with a portion of the carrier strip between the said line of weakness of the second series therein and the other of said transverse edges free of the segment of the stencil strip in the individual stencil assembly,

thereby permitting securement to an imprinter of each individual stencil assembly along said one transverse edge thereof including both the carrier strip segment and the stencil strip segment of the individual stencil assembly and subsequent tearing away of the free portion of the carrier strip segment, leaving a portion of the carrier strip segment along said one transverse edge secured to the imprinter.

9. The method of making a continuous stencil assembly as set forth in claim 1 comprising feeding forward from respective supplies thereof a continuous stencil strip and a continuous carrier strip, bringing these strips together with the stencil strip extending longitudinally of the carrier strip on one face of the carrier strip, forming lines of weakness in the carrier strip as it is fed forward toward the stencil strip with these lines of weakness extending transversely of the carrier strip and spaced at stencil height intervals along the length of the carrier strip, these lines constituting the said second series of lines of weakness, and forming lines of weakness in the combined stencil and carrier strips with said lines extending transversely of the strips and also spaced at stencil height intervals but offset longitudinally from the lines of weakness of said second series in the carrier strip and constituting the said first series of lines of weakness, the stencil strip being secured to the carrier strip in the manner specified in claim 1 as the strips are brought together.

4,348,954

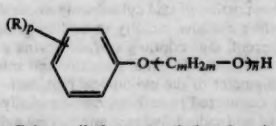
AGENT FOR PROTECTING THE SURFACE OF LITHOGRAPHIC PRINTING PLATE

Yoshio Okishi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 51,300, Jun. 22, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,525
Claims priority, application Japan, Jun. 23, 1978, 53-76164; Nov. 29, 1978, 53-148519
The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.
Int. Cl.³ G03F *7/02*
U.S. Cl. 101—465 **44 Claims**

1. A process for gumming a lithiographic printing plate having a hydrophilic non-image area and a lipophilic image area which comprises the steps of:

(a) preparing a protective agent comprising an aqueous phase having dissolved therein a film-forming hydrophilic high molecular weight compound for protecting the non-image area and an oil phase containing a water-insoluble organic solvent and a surfactant, wherein said surfactant is comprised of an alkylphenyl type nonionic surfactant represented by the general formula (I)



(I)

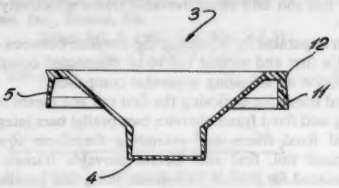
where R is an alkyl group, p is 1 or 2, m is an integer of 1 to 4 and n is an integer of 2 or more, the surfactant having an HLB less than 14 and a sodium salt of a dialkylsulfosuccinate; and

(b) coating a plate with said emulsion-type protective agent.

4,348,955
EXPLOSIVE CONTAINER

Edward K. Rowley, Beloeil, and Allison A. Sprague, Ville Lemoyne, both of Canada, assignors to C-I-L Inc., Ontario, Canada

Filed Nov. 21, 1980, Ser. No. 208,944
Claims priority, application Canada, Dec. 14, 1979, 342100
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—317 **5 Claims**

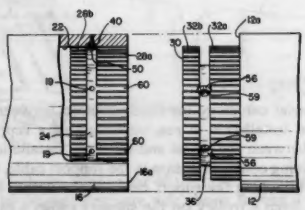


1. In a blow-molded cylindrical plastic container adapted for filling with explosives and for connection with a like container to form a column of containers, said container comprising an external engagement means and integrally sealed end closure on a reduced diameter male end thereof and an internal engagement means on an open female end thereof, the said male and female ends being adapted for interconnection between like containers, the improvement comprising a section of reduced diameter in a portion of said container immediately adjacent but beyond the said female engagement means, said reduced diameter section being adapted to receive and retain therein in substantially hermetic engagement a sealing member comprising a substantially disc-like, conically recessed, yieldable plastic member having a diameter equivalent to the diameter of the said reduced diameter section, said sealing member also comprising an integral, outwardly flared skirt-like section around its circumference extending in a direction of the apex of said conical recess and adapted for sealable, slidable, engagement with the inner wall of said section of reduced container diameter.

4,348,956
ARTILLERY SHELL COMPRISING TWO SECTIONS HAVING COMPLEMENTARY COUPLING MEMBERS FOR CONNECTING THE SECTIONS TOGETHER

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1980, Ser. No. 182,358
Int. Cl.³ F42B *15/10*
U.S. Cl. 102—377 **10 Claims**

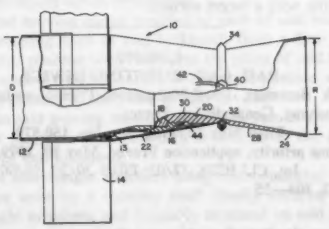


1. An artillery shell comprising:
a first section including a first end section,
a second section including a second end section which abuts said first end section when said sections are connected to each other,
complementary coupling means for removably connecting said first and second sections to each other, said complementary coupling means including coaxial coupling means for coaxially coupling said sections, wherein said coaxial coupling means comprises a cylindrical coaxial projection connected at one end to said first end section and a coaxial bore located in said second end section configured to slidably receive said projection when said end sections are brought together in an abutting relationship,
relative rotation means for preventing relative rotation of the coupled sections, and
locking means for preventing relative axial movement of the coupled sections,
wherein said locking means includes:
(a) a circumferential external groove about the periphery of said cylindrical projection and a circumferential internal groove located about the internal periphery of said bore, said internal groove located within said bore so as to be disposed opposite to and surround said external groove when said end sections are brought together, and
(b) at least two locking assemblies which can be engaged to prevent axial movement or disengaged to permit the disconnection of said sections, wherein each of said locking assemblies includes a movable segment and a threaded member for threadably engaging said movable segment, for moving said segment into said internal groove to a locking position and for moving said segment out of said internal groove to an unlocked position whereby said sections can be disconnected, and wherein each of said segments is an arcuate member having a radius of curvature which is greater than the radius of said internal groove, whereby said radius of curvature of said arcuate member decreases as said segments are moved into their locked positions.

4,348,957
BOATTAIL EMERGENCE BY EJECTING NOZZLE EXIT CONE

James W. White, Huntsville, Ala., and Joseph J. McDermott, deceased, late of Huntsville, Ala. by Rosalie L. McDermott, executrix, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1980, Ser. No. 172,879
Int. Cl.³ F42B *15/10*
U.S. Cl. 102—378 **2 Claims**



1. A missile having a rocket motor structure with a nozzle structure attached thereto, said nozzle structure having an outwardly tapering outer surface, a frustaconical boattail structure mounted over and about an end portion of said rocket motor structure and a forward portion of said rocket nozzle structure, said boattail structure having an outward surface that tapers inwardly from a forward portion to a point of tangency with the outwardly tapering outer surface of said rocket nozzle, means about said rocket nozzle at said point of tangency and mounted relative to the rocket nozzle, means for causing said portion of said rocket nozzle with said outwardly tapering surface to be separated from the remainder of said rocket nozzle structure by said means about said rocket nozzle at said tangency point to cause a boattail end structure of about

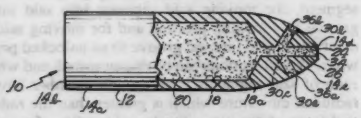
1-caliber in length to be formed on said missile, said rocket motor having a predetermined internal diameter and said rocket motor nozzle having a predetermined internal diameter at an exit end of said rocket nozzle which is substantially equal to said predetermined internal diameter of said rocket motor, said means about said rocket nozzle at said point of tangency being a shaped charge that is spaced a predetermined distance from said rocket motor nozzle and has means for setting off said shaped charge at the appropriate time to sever said nozzle end structure and leave said boattail structure on the missile, and said means for setting off said shaped charge including a power supply and timing means that are inner connected to said shaped charge to cause said shaped charge to be set off at the appropriate time.

4,348,958

PROJECTILE HAVING IMPACT RESPONSIVE INITIATOR MEANS

Edward A. Day, Rancho Santa Fe, Calif., assignor to Systems, Science and Software, La Jolla, Calif.

Filed May 15, 1980, Ser. No. 150,061
Int. Cl.³ F42B *13/12*; F42C *1/10*
U.S. Cl. 102—499 **13 Claims**



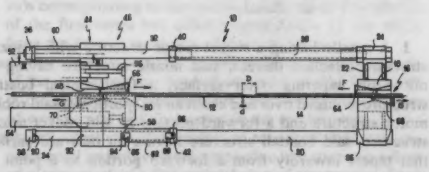
1. An explosive projectile comprising a body having a forward flight end and defining an internal chamber, a main high explosive charge disposed within said internal chamber and being capable of detonation, at least one passage formed within said body in direct communicating relation with said chamber and opening outwardly of said flight end of said body, impact responsive initiator material disposed within said passage so as to completely fill said passage between said high explosive charge and the forwardmost end of said passage, and a thin cover formed over the outer exposed end of said passage, said initiator material enabling safe handling and high velocity launching of said projectile but being capable of impact responsive detonation to effect detonation of said main explosive charge upon predetermined impact of said flight end of said projectile with a target surface.

4,348,959

RAIL GAP ADJUSTING DEVICE

Patrick Bommart, Ruell-Malmaison, France, assignor to C. Delachaux, Gennevilliers, France

Filed May 16, 1980, Ser. No. 150,579
Claims priority, application France, May 18, 1979, 79 12686
Int. Cl.³ B23K *37/02*; E01B *29/20, 33/00*
U.S. Cl. 104—15 **6 Claims**



1. An apparatus for adjusting the distance between the butt-ends of a first and second rail to be connected comprising: a fixed frame for enclosing the first rail and means for securing said fixed frame thereto; two parallel bars integral with said fixed frame and extending therefrom toward the second rail, first and second movable frames, slidably mounted for limited movement along said parallel bars in the region of the second rail, means for selectively securing one of said movable frames relative to said parallel bars and means for selectively securing the other of said movable frames relative to the second rail; and jacks in communication with said first and second movable frames for effecting relative movement therebetween such that said movable frame selectively secured to said parallel bars together with said fixed frame and the first rail onto which said fixed frame is secured, is integrally shiftable relative to the second rail and said other movable frame selectively secured thereto.

6. An apparatus for adjusting the distance between the butt-ends of a first and second rail to be connected comprising in combination an adjusting apparatus comprising:

a fixed frame for enclosing the first rail and means for securing said fixed frame thereto; two prallel bars integral with said fixed frame and extending therefrom toward the second rail, first and second movable frames, slidably mounted for limited movement along said parallel bars in the region of the second rail, means for selectively securing one of said movable frames relative to said parallel bars and means for selectively securing the other of said movable frames relative to the second rail; and jacks in communication with said first and second movable frames for effecting relative movement therebetween such that said movable frame selectively secured to said parallel bars together with said fixed frame and the first rail onto which said fixed frame is secured, is integrally shiftable relative to the second rail and said other movable frame selectively secured thereto; and

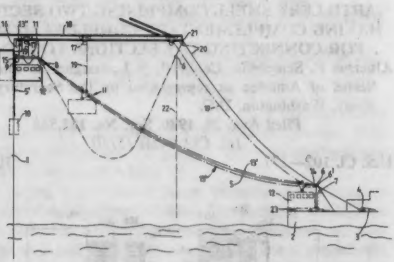
a carriage onto which said adjusting apparatus is mounted for the support and transport thereof.

4,348,960

AERIAL CABLEWAY BETWEEN A SEA VESSEL AND A FIXED INSTALLATION

Erik Staurseth, Mandal, Norway, assignor to Westamarin A/S, Mandal, Norway

Filed Sep. 30, 1980, Ser. No. 192,236
Claims priority, application Norway, Oct. 10, 1979, 793262
Int. Cl.³ B61B *7/02*
U.S. Cl. 104—114 **2 Claims**



1. An aerial cableway for transportation between a vessel and a fixed installation at sea, consisting of a support cable stretched between the vessel and the fixed installation, means for maintaining constant tension in the support cable, means for releasably attaching the suport cable to the vessel, a gondola suspended from a trolley on the support cable, a pulling line attached to the trolley, of the pulling line travelling over a pulley on the vessel and running back to the fixed installation onto pulling winches one at each end of the pulling line on the fixed installation, whereby one end of the pulling line pays out when the other end is heaved in, and vice-versa, an outrigger on the fixed installation, at the outer end of which a securing member for the support cable is fastened so as to enable said support cable to be raised and lowered, a hoisting cable which

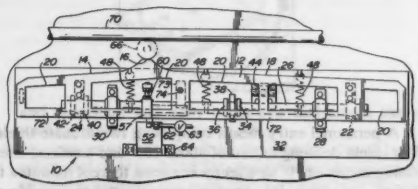
is maneouverable from the fixed installation for raising and lowering said securing member and a drop line attached to the securing member which, when the securing member and thus also the support cable have been hoisted into an elevated, not-in-use position, hangs down toward the surface of the sea.

4,348,961

FAIL-SAFE CONTROL DEVICE FOR DRIVERLESS VEHICLES

Peter H. Rohrbach, Bethlehem, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Jul. 7, 1980, Ser. No. 166,511
Int. Cl.³ B61K *7/02*
U.S. Cl. 104—252 **9 Claims**



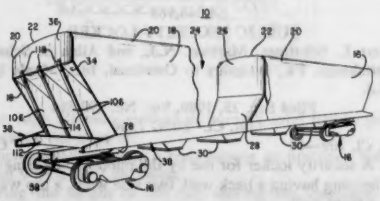
1. A control device for controlling the speed of a vehicle in a conveyor system of vehicles which move along a track comprising a cam having a cam surface for contact with a cam follower on a vehicle, means mounting said cam surface for movement between operative and inoperative positions, said cam having converging cam surfaces along one side edge, said cam having a flat straight surface area for contact with a roller on a vehicle whose speed is controlled by said cam surfaces, said mounting means including horizontally disposed shaft below the elevation of said cam, said area being on one side of the axis of said shaft and said cam surfaces being on the other side of said axis, a motor coupled to said cam for selectively retaining said cam in an operative position, and means for automatically moving said cam surface to an operative position from an inoperative position upon failure of supply of power to said motor.

4,348,962

RAILWAY HOPPER CAR BOLSTER ASSEMBLY

Stephen W. Smith, Carrollton, Tex., assignor to Trinity Industries, Inc., Dallas, Tex.

Filed May 31, 1979, Ser. No. 44,257
Int. Cl.³ B61D *7/04;* **B61F** *1/10, 1/12*
U.S. Cl. 105—248 **12 Claims**



1. In a railway hopper car of the type including a car body defined by opposite arcuate side sheets having a side sill extending longitudinally along the lower margin of each side sheet and at least a first end slope sheet partially defining an end hopper compartment, the combination with the car body of an end support structure for the end hopper compartment, the end support structure including a bolster assembly comprising:

a substantially horizontally disposed shear plate having opposite side portions secured to the side sills, said shear plate forming a channel provided by a first upturned end portion forming a first end sill secured to the first end slope sheet and a second upturned end portion forming a second end sill;

a stub center sill disposed subjacent and connected to the shear plate substantially in alignment with the longitudinal axis of the car body;

a bolster beam extending transversely with respect to the longitudinal axis of the car body on either side of the stub center sill and interconnecting the stub center sill with each side sill;

a bolster web assembly interconnecting the stub center sill, the shear plate and the bolster beam;

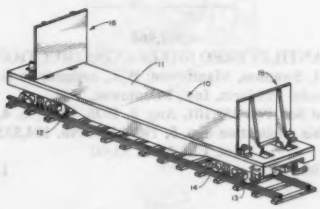
a plurality of vertical gusset plates interconnecting the first end slope sheet and shear plate, each of the gusset plates having a first edge portion connected to the first end slope sheet and a second edge portion connected to the shear plate, the gusset plates being disposed in spaced parallel relation with respect to each other in an array which extends laterally with respect to the longitudinal axis of the car.

4,348,963

RETRACTABLE BULKHEADS FOR RAILROAD FLAT CARS

Curtis Dancy, 30903 S. Kaster Rd., Tracy, Calif. 95376

Filed Oct. 28, 1980, Ser. No. 201,572
Int. Cl.³ B61D *17/06*
U.S. Cl. 105—363 **8 Claims**



1. In a railroad bulkhead flatcar having a flat bed and spaced bulkheads for enclosing material therebetween on said flat bed, the improvement which comprises:

bulkhead moving means coupled to each of said bulkheads for rotating each of said bulkheads from a first upright vertical position with respect to the plane of said flat bed downwardly and inwardly to a second position substantially parallel to the plane of said flat bed

wherein said moving means comprises a pair of spaced upright members each of which is secured to the external side of said bulkhead,

each of said upright members being interconnected at their lower ends by a rotating shaft fixedly secured to said upright members, and rotatably mounted on said car,

and piston means mounted on said car operatively connected to at least one of said upright members to rotate same.

4,348,964

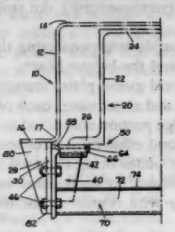
SLIDING SILL LOW FRICTION SUPPORTING PLATE ASSEMBLY

Robert W. Randolph, St. Charles, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,259
Int. Cl.³ B61D *17/04;* **B61F** *1/08;* **B61G** *9/20*
U.S. Cl. 105—42 D **7 Claims**

1. A low friction sliding sill support assembly comprising: a fixed sill including a pair of lower, outwardly extending fixed sill flanges; a generally vertical longitudinally extending sup-

port plate integrally connected to each fixed sill flange on each side of the fixed sill; a separate longitudinally extending sliding sill support rigidly connected to each support plate; each said sliding sill support also including a horizontal portion that extends transversely inwardly of the car; said sliding sill supports being spaced apart and located below said fixed sill flanges; a pair of low friction material wear plates adopted to be slipped in place upon said sliding sill supports; said wear



plates including horizontal body portions on each side of the fixed sill upon which the sliding sill rides moving back and forth relative to said fixed sill; each wear plate including means for engaging the inner and outer ends of its respective sliding sill support; said wear plates being made of resilient material having a low coefficient of friction with steel; and good strength in compression to withstand the longitudinal movement of the sliding sill.

4,348,965

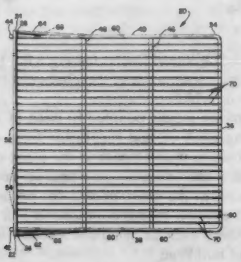
CANTILEVERED SHELF CONSTRUCTION

Richard H. Swanson, Manitowoc, Wis., assignor to Kelvinator Commercial Products, Inc., Manitowoc, Wis.

Division of Ser. No. 931,101, Aug. 4, 1978, Pat. No. 4,250,815. This application Sep. 5, 1980, Ser. No. 184,533

Int. Cl.³ A47B *55/02*

U.S. Cl. 108—152 **11 Claims**



1. A shelf construction comprising: a planar shelf means; a cross bar secured at the upper rear of said shelf means providing a short lateral trunnion-like projection extending from adjacent each top rear corner of said shelf means; abutment means depending from the rear side edges of said planar shelf means having terminal abutment portions disposed below said projections; said shelf means being made from a U-shaped rod; said trunnion-like projections are end portions of said cross bar which is rigidly secured to the ends of said U-shaped rod, said end portions being projected beyond the side legs of said U-shaped rod; a second U-shaped rod spaced below said first named U-shaped rod; means rigidly securing the front and side leg portions of both U-shaped rods to each other with the rear portions of said second U-shaped rod being bent at a downward and slightly outward inclination and terminating in abutment ends and comprising said abutment means.

4,348,966

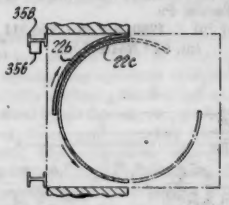
TRANSACTION SECURITY SYSTEM AND MODULAR TRANSACTION PROCESSING CENTER

Otis H. Hastings, 130 E. Crescent Ave., Mahwah, N.J. 07430

Division of Ser. No. 827,593, Aug. 25, 1977, Pat. No. 4,121,523, which is a continuation-in-part of Ser. No. 602,404, Aug. 6, 1975, abandoned. This application Oct. 19, 1978, Ser. No. 952,782

Int. Cl.³ E05G *5/00*

U.S. Cl. 109—2 **11 Claims**



1. A personnel entry means comprising two arcuate shields, a first shield defining an arc of about 180° and a second shield defining an arc of 90° or slightly in excess thereof mounted for rotation concentrically about a common axis to provide sequentially for movement between first, second and third primary positions relative to each other and about an object passing through the perimeter defined by the path of rotation of said shields; said shields being adapted to provide a concentric arc in said first position, in which, in combination, the arc defined thereby does not exceed about 180° while occluding the passage spanned by and behind said shields, barring access thereto to the occupant within said perimeter; said first shield being adapted to rotate to said second position, where in said latter position, one lateral border of each of said shields is in registry with the other of said shields defining a closed area about said perimeter that is equal to the sum of the arcs defined by both of said shields; said shields in this latter position continuing to occlude the passage spanned thereby in said first position; said shields being adapted further to rotate to said third position in which said shields are arrayed concentrically on the side of said perimeter opposite to that of said first position and in which said shields define an arc not in excess of about 180° while providing by movement of both of said shields in opposing arcuate paths about said perimeter unimpeded passage into the space occluded by said shields in said first and second positions; and completely occluding the previously unoccluded space about said perimeter in said third position.

4,348,967

PUBLIC SECURITY LOCKER

Robert L. Schattner, Marlton, N.J., and Allen S. Schattner, Pittsburgh, Pa., assignors to Omnimed, Inc., Maple Shade, N.J.

Filed Sep. 25, 1980, Ser. No. 190,514

Int. Cl.³ E05G *1/04*

U.S. Cl. 109—51 **7 Claims**

1. A security locker for use by the public comprising:

a housing having a back wall, two side walls, a top wall and a front wall;

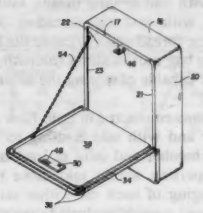
said front wall having a stationary portion and an opening providing access to the interior of said housing;

a door pivotally mounted at its bottom to said stationary portion of said front wall to pivot about a horizontal axis (housing) for covering said opening, wherein said stationary portion of said front wall and said door include a base portion and a rim portion extending from the periphery of said base portion toward said housing, the periphery exterior of said top, bottom and two side walls being enclosed by said base and rim portion of said stationary portion of

said front wall and said door, when said door is in the closed position;

combination lock means for locking said door closed to said housing;

dial means of said lock means accessible from the exterior of said housing for locking said lock means when said dial means does not have a predetermined sequence of symbols



and unlocking said door when said dial means has said predetermined sequence of symbols;

setting means unaccessible from the exterior of said housing when said door is closed for changing said predetermined sequence whereby the sequence can be secretly personalized by each of a plurality of short-term users; and

fastener means for permanently mounting said housing to a pre-existing structure in an area used by the public.

4,348,968

METHOD AND APPARATUS FOR BURNING SOLID FUEL

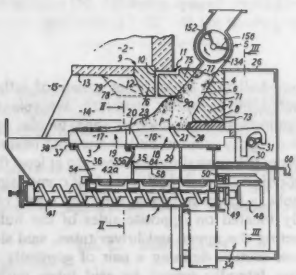
Viking V. Demar, Ave. Conde Sallent 17v, Palma-Mallorca, Spain

Filed Jul. 30, 1980, Ser. No. 173,522

Claims priority, application United Kingdom, Aug. 10, 1979, 7927988

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—344 **23 Claims**



1. A high intensity method of burning solid fuel in pieces, comprising the steps of:

advancing the fuel along a path having an upstream portion from which air is excluded;

metering the height of the fuel leaving the upstream path portion to define a predetermined cross section for the fuel as it leaves the upstream path portion and enters a first downstream path portion in a reverberatory combustion space as a thick fuel bed;

passing a first high velocity stream of air from below the first downstream path portion upwardly through the fuel bed in a self-sustaining ignition zone, the first stream of air supplying the major portion of the oxygen required for combustion and having upstream and downstream boundaries extending transversely of the path, the fuel being rapidly heated and ignited as it moves through the upstream boundary, the metered height of the fuel fed being such in relation to the speed of advance of the fuel and the distance between the upstream and downstream boundaries that the size of the fuel pieces and the thickness of the burning fuel bed at the downstream boundary is still sufficient to prevent destabilization of the fuel bed by the first stream; and

passing a second, lower velocity stream of air, sufficient to complete combustion, through the fuel bed at a second downstream path portion which is downstream of the first downstream path portion, the second stream being diffused over a sufficient length of the path downstream of the first stream so as to be of sufficiently low velocity to avoid entrainment of the burning-out fuel particles from the fuel bed.

4,348,969

SEWING MACHINE WITH A HORIZONTAL-TYPE LOOP TAKER

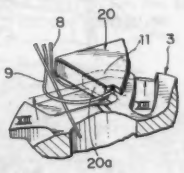
Noboru Kasuga, Hachioji; Kazumasa Hara, Tama, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

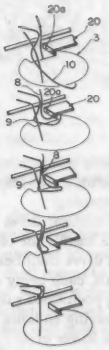
Filed Mar. 11, 1980, Ser. No. 129,206

Claims priority, application Japan, Mar. 26, 1979, 54-38906[U]

Int. Cl.³ D05B *57/14, 3/02*

U.S. Cl. 112—184 **1 Claim**





1. In a sewing machine having a main shaft rotated to vertically reciprocate a needle carrying an upper thread, said needle being swingable transversally of the fabric feeding direction, a throat plate having an upperside and an underside and secured to a machine bed, said throat plate having an aperture formed therein through which the needle traverses to penetrate a fabric to be sewn to thereby produce a thread loop under the throat plate, and loop taking means of horizontal type, a combination comprising a loop taker including a loop taking hook rotated by the main shaft; a bobbin carrier supported in the loop taker and carrying therein a bobbin loaded with a lower thread for forming stitches together with the upper thread, said loop taking hook adapted to take said thread loop to enlarge the same around the bobbin carrier and release the same in the

vicinity of the aperture of the throat plate; and thread loop regulating means including a flat plate having a downwardly directed lip formed at one end thereof and extended in the fabric feeding direction, said flat plate being secured to the underside of the throat plate, said bobbin carrier being formed with an upper raised portion, said flat plate and said upper raised portion together with said downwardly directed lip defining a path for guiding the thread loop after the thread loop has been released from the hook of the loop taker, said loop guiding path being so formed as to guide the thread loop, substantially in a direction opposite to the normal fabric feeding direction, said downwardly directed lip providing an end at which the guided thread is released.

4,348,970

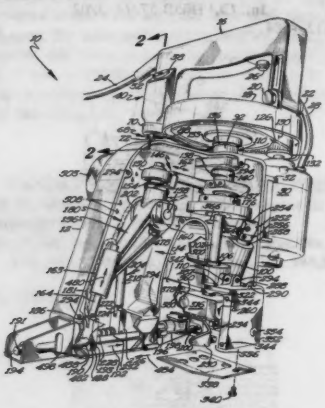
SELF-OILING PORTABLE BAG-CLOSING SEWING MACHINE

Robert J. Robinson, North Oaks; David B. Johnson, and Verdell H. Schroeder, both of Minneapolis, all of Minn., assignors to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.

Filed Apr. 1, 1980, Ser. No. 136,312

Int. Cl.³ D05B *71/00*

U.S. Cl. 112—256 **33 Claims**



1. A self-oiling portable bag-closing sewing machine energizable from a power source, and capable of using thread to stitch a bag closed comprising:

a housing having an internal drive train chamber and said housing including a handle for carrying the machine;

first and second main drive shaft bearings, each said bearing having a central axis, each being carried by said housing, said bearings being positioned substantially coaxially, and each said bearing having an inner and an outer periphery, and an upper and a lower end;

driving means selectively connectable to the power source, carried by said housing, and including a motor and a main drive shaft rotatably mounted in said first and second main drive shaft bearings for rotation about the longitudinal axis of said main drive shaft, and said main drive shaft extending within said drive train chamber and being drivingly connected with said motor to rotate said main drive shaft when the motor is energized;

a needle driving assembly including a needle having a longitudinal axis, said needle driving assembly being operatively movingly connected with said driving means to move said needle along said longitudinal axis of said needle in reciprocating movement in response to energizing of said driving means;

a feed dog assembly carried by said housing and operatively connected to said driving means to actuate said feed dog assembly for cooperation with said needle driving assembly in response to energizing of said driving means;

a presser foot unit carried by said housing and selectively bearing against said feed dog assembly and cooperating with said feed dog assembly to urge the bag against said feed dog assembly and thereby assist in moving the bag along a path past the needle;

a looper assembly carried by said housing and operatively connected with said driving means, said looper assembly cooperating with said reciprocating needle to form a stitch with the thread so as to cause the bag to be stitched closed as the bag moves along the path;

an oil reservoir capable of storing the oil and carried by said housing; and

oil delivery means connected in fluid flow relation with said oil reservoir and with said housing to direct oil to said drive train chamber and onto at least one of said assemblies for dispersion within said drive train chamber by outward flinging of such oil within said chamber by at least one of said assemblies during operation of the sewing machine.

4,348,971

MULTI-HULL BOATS

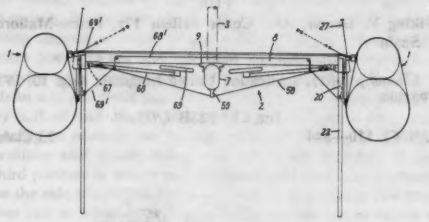
Jon A. Montgomery, Teddington, England, assignor to Roger Derek Morrison-Jones, Waterloo, Belgium, a part interest

Filed Mar. 30, 1978, Ser. No. 892,094

Claims priority, application United Kingdom, Apr. 4, 1977, 14196/77

Int. Cl.³ B63B *7/08*

U.S. Cl. 114—61 **5 Claims**

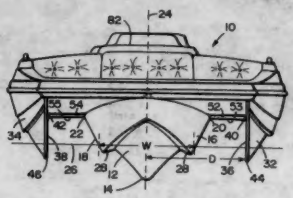


1. A multi-hull boat comprising a pair of inflatable hulls interconnected by a central structure, wherein the central structure comprises a central longitudinal tubular torsion beam to which are rigidly secured hull connecting beams extending outwards from the central torsion beam to at least three spaced attachment points on each hull, each hull comprising an upper inflatable tube, a lower inflatable tube and a pair of side walls respectively located on opposite sides of the hull and each interconnecting the upper and lower tubes, said side walls as seen in cross section defining a pair of generally upstanding straight lines laterally spaced by said tubes with each line extending substantially tangent to both tubes on its respective side of the hull, such that said side walls, the upper surface of the upper tube and the lower surface of the lower tube enclose the hull and form a continuous smooth oval hull outer cross section, the heights of the free portion of the side walls extending between the tubes being small enough to partly vertically compress the tubes one against the other when inflated, thereby to hold the side walls in tension, wherein the bow end of each tube tapers off towards the bow substantially to a point to form a tapered nose portion, said tapered nose portions being spaced apart from each other by a vertical spacer wherein a said spacer is inserted between the tapered nose portions of the tubes, said nose portions of said tubes and said spacer being covered by the side walls wherein said side walls continue forward to cover said spacer and produce a substantially conventional sharp yet upstanding bow on the inflatable hull.

4,348,972
MULTIPURPOSE TRIMARAN

Vaughan V. Parsons, 25640 Via Crotalo, Carmel, Calif. 93921

Filed May 23, 1980, Ser. No. 152,596
Int. Cl.³ B63B 1/12
U.S. Cl. 114—61 16 Claims



1. A boat structure (10) comprising:

a central hull (12) having a lowermost portion (14), lateral sides (16, 18) having upper portions (20, 22) and being generally equally spaced from a central plane (24) of symmetry of the central hull (12), the central hull (12) being of a width (W) at the waterline (26) when floating at rest;

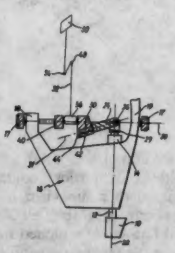
a pair of side hulls (32, 34) having infacing sides (36, 38) having top portions (40, 42) and bottom portions (44, 46), said infacing sides (36, 38) being generally equally spaced a distance (D), which is from about two-thirds to about four-thirds said width (W) from said plane (24) over generally the length of said side hulls (32, 34), the entire bottom portions (44, 46) of the side hulls (32, 34) being spaced above the lowermost portion (14) of the central hull (12) and being positioned below the waterline (26) when said hulls (12, 32, 34) are floating at rest; and

a pair of substantially horizontal port and starboard bridges (52, 54) having bottoms (53, 55) and extending substantially the length of said side hulls (32, 34), said bridges (52, 54) connecting the top portions (40, 42) of the side hulls (32, 34) to the upper portions (20, 22) of the lateral sides (16, 18) of the central hull (12), the entire bottoms (53, 55) of said bridges (52, 54) being spaced above the water line (26) when said hulls (12, 32, 34) are floating at rest.

4,348,973
MOTION TRANSFER APPARATUS FOR USE IN SELF STEERING APPARATUS FOR BOATS

Brian A. J. Ellis, 62 Hilton Rd., Mapperley, Nottingham, England

Continuation-in-part of Ser. No. 872,523, Jan. 26, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,445
Claims priority, application United Kingdom, Feb. 2, 1977, 4275/77
Int. Cl.³ B63H 25/04
U.S. Cl. 114—144 C 5 Claims

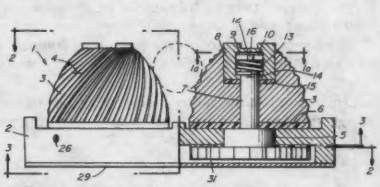


1. Motion transfer apparatus comprising a first movable member, a second member rotatable within a support about a first axis, and transmission means for converting movement of said first member to rotational movement of said second member about said first axis, said transmission means comprising a control arrangement having a first part which, on movement of said first member, is rotatable about a second axis intersecting said first axis, and a second part which is connected to the said second member to be pivotable relative thereto about a third axis, said first, second and third axes being orthogonal and intersecting with one another at the same point, said first part having means defining a bore extending on a fourth axis which is at an angle to said second axis and which passes through the intersection of the first, second and third axes, and said second part being at least partly located in said bore to be rotatable about the axis of the bore, the support being pivotable about said second axis, such that said second part rotates with said first part about said second axis on initial movement of said first member, and effects resultant movement of said second member about said first axis, and rotation of said first part about said second axis is effected on initial movement of said second member about said first axis, movement of said second member and the support together about said second axis having substantially no effect on said first part movement.

4,348,974
CLEAT

Michael Lerner, 7 Holyoke St., Boston, Mass. 02116

Filed Dec. 20, 1979, Ser. No. 105,554
Int. Cl.³ B63B 21/04
U.S. Cl. 114—218 12 Claims



1. A cleat for securing a line, which cleat comprises:

(a) a base plate;

(b) a pair of first and second dome elements, each element characterized by a high friction line engaging surface, the first and second dome elements spaced apart and adapted to receive and hold a line placed between the dome elements;

(c) first and second shaft means to connect the first and second dome elements, respectively, to the base plate; and

(d) ratchet means connected to each of the shaft means to permit each of the shaft means to rotate in only one direction whereby a line which is secured between the dome elements can be drawn through the dome elements in a forward direction but will hold against tension applied in a reverse direction.

4,348,975
SUPPLY BOAT SPOOLING SYSTEM

Peter G. S. Dove, 13403 Sea Island Dr., Houston, Tex. 77069

Filed Nov. 21, 1979, Ser. No. 96,503
Int. Cl.³ B63B 21/16, 21/22
U.S. Cl. 114—254 5 Claims

1. Apparatus on a boat for handling cable used in mooring systems in offshore operations comprising:

a boat for handling cables, said boat having a rearwardly located deck surface arranged for guiding cable between an underwater anchoring location and a spooling location at a forwardly located deck surface on the boat;

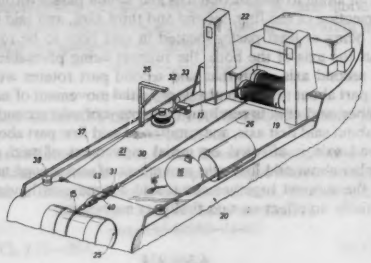
at least two independent spooling winches on said deck surface, said spooling winches being located generally

centrally of the width of the deck of said boat at said spooling location;

spool means on each of said spooling winches and means for driving said spooling winches rotatably about horizontal axis so that each spooling means may spool or unspool cables independently of one another;

one of said spool means on one of said winches carrying a towing cable and the other of said spool means on the other of said winches being normally empty of cable;

independent storage spool means located intermediate of



said rearward deck surface and said spooling location to one side of the length of said deck surface;

mounting means for rotatably driving said storage spool means about its central axis whereby cable on a winch spool means may be transferred to or from one spooling winch to said storage spool means independent of the other spooling winch in the same time frame;

means for releasably coupling said mounting means to said storage spool means; and

means proximate to said mounting means for moving a storage spool means onto or off of said mounting means.

4,348,976

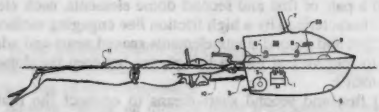
DIVER TOW COMPRESSOR UNIT

Donald R. Gilbert, 58 McNeill St., Encinitas, Calif. 92024

Filed Mar. 11, 1980, Ser. No. 129,605

Int. Cl.³ B63C *11/46*

U.S. Cl. 114—270 **5 Claims**



1. A floating vessel of lightweight construction, operable to tow divers, comprising:

a. a hull having a stern;

b. a power plant disposed within the hull;

c. a propulsion means mounted to be driven by said power plant through a first clutch;

d. an air compressor mounted to be driven by said power plant through a second clutch;

e. switching means connected to said clutches to activate operation of said propulsion means while deactivating said air compressor and to activate said air compressor while deactivating said propulsion means;

f. a steer bar disposed on the exterior of the stern and projecting outwardly away from the hull so as to enable a diver to grasp onto and steer the hull;

g. control means for the power plant being disposed on the exterior of the stern so that the diver has ready access thereto; and

h. hand actuated control means for said switching means being disposed on said steer bar so as to enable the diver to operate said switching means.

4,348,977

WATER CONVEYANCE

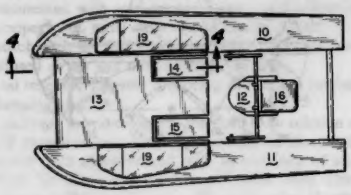
Tadishi Okajima, 1-12-6 Taishibashi, Asahi-ku, Osaka, Japan

Filed Apr. 30, 1979, Ser. No. 34,343

Claims priority, application Japan, Mar. 3, 1979, 54-024960

Int. Cl.³ B63B *1/00*

U.S. Cl. 114—273 **12 Claims**



1. A water conveyance which comprises:

first and second hull means spaced from each other;

airfoil means extending between said hull means toward the bow thereof, said airfoil means having pivotable flaps extending toward the stern thereof;

a pivotable lever attached to each of said hull means and an interconnecting support extending therebetween;

means for propelling said conveyance over the water, attached to said interconnecting support;

hydrofoil means attached to said interconnecting support;

means for pivoting both of said pivotable levers in unison, whereby said hydrofoil means and said means for propelling may be simultaneously raised and lowered; and

means for adjusting said airfoil pivotable flaps.

4,348,978

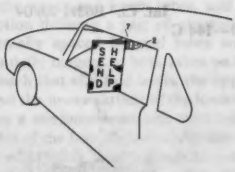
AUTA-HELP

George C. Brucato, 1 S. 102 Lawler, Lombard, Ill. 60148

Filed Jan. 13, 1981, Ser. No. 208,703

Int. Cl.³ B60Q *1/00*; G09C *17/00*

U.S. Cl. 116—28 R **1 Claim**



1. A signal device comprising a flag and a flap pole adapted to be stored inside a cylindrical container, said container adapted to be clipped to a sun visor of a vehicle for ready availability by an occupant of the vehicle;

one edge of said flag being attached to said pole;

said pole having a planar plastic handle on one end thereof, said handle having a grip portion, said grip portion having a circular finger hole therethrough;

said handle having a mounting portion formed therein to

embrace the top edge of a vertically movable window of the vehicle, said handle having an extension rising above said mounting portion to maintain the top edge of the window from a closed position when said device is in a mounted position;

and the periphery of said handle and said finger hole being provided with a flange extending perpendicularly to the planar handle for added strength.

4,348,979

DEVELOPER UNIT FOR DRY TONER ELECTROPHOTOGRAPHIC COPIER

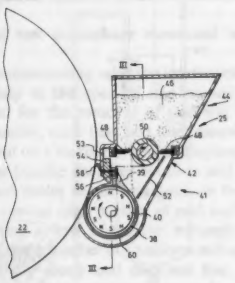
Joseph W. Daintrey, Walthamstow, England, assignor to Gestetner Manufacturing Limited, London, England

Filed Apr. 27, 1981, Ser. No. 258,029

Claims priority, application United Kingdom, May 2, 1980, 8014768

Int. Cl.³ G03G *15/00*

U.S. Cl. 118—688 **7 Claims**



1. A magnetic brush monocomponent developer unit comprising:

(a) magnetic roller means having an axis and several magnetic poles distributed around its said axis;

(b) cylindrical support means for a rotating layer of toner concentric with said roller;

(c) means applying toner to said cylindrical support means;

(d) doctor blade means positioned adjacent the cylindrical support means, for rendering the rotating layer uniform; said doctor blade means having first and second sides arranged so that in use of the developer unit a rotating layerof toner on said cylindrical support moves towards said first side; and

(e) toner-responsive means comprising (i) coil means mounted on said doctor blade means on said first side thereof so as to be intersected by the moving magnetic field of the said poles of the magnetic roller means when said magnetic roller means is rotating in use of the developer unit, said coil means being positioned such that the strength of the magnetic field induced in the coil means by the fields of the magnetic poles of the magnetic roller means will depend upon the amount of toner held back by the doctor blade means, and (ii) means responsive to the field intersecting said coil means, for controlling supply of toner to said cylindrical support means.

4,348,980

APPARATUS FOR THE BORONIZING OF PIECES MADE OF METAL OR CERMET AND SURFACE-BORNISHED PIECES

Francois H. J. Thevenot, Saint-Etienne; Patrice M. V. Goeuriot, Firminy; Julian H. Driver, Saint-Etienne, and Jean-Paul R. Lebrun, Bougival, all of France, assignors to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines), Paris, France

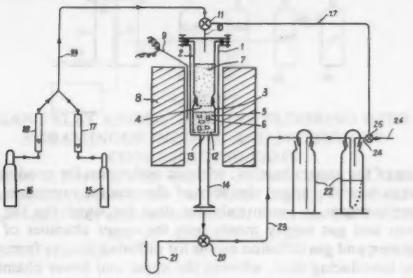
Division of Ser. No. 123,425, Feb. 21, 1980, Pat. No. 4,289,545.

This application May 8, 1981, Ser. No. 261,939

Claims priority, application France, Feb. 27, 1979, 79 04991

Int. Cl.³ C23C *11/00, 11/08*

U.S. Cl. 118—717 **4 Claims**



1. Apparatus for boriding a workpiece of an alloy of Fe, Ni, Co or a cermet with boron trifluoride comprising a reactor received in an enclosed heating means, the reactor having a closed fluid-tight lower portion and a sealable upper portion extending partially from said heating means said reactor having a perforated workpiece grid near its base for retaining a workpiece to be borided, a container suspended in the upper portion of the reactor and having therein a first perforated holding grid and a second perforated holding grid spaced apart from and below said first perforated holding grid, a cover means hermetically sealing the reactor and the container therein, gas inlet means for introducing boron trifluoride gas extending through said cover and terminating adjacent said first perforated grid, flue means for exhausting gases from said reactor positioned adjacent said grid for holding said workpiece and extending through said cover, the gas inlet and flue means adapted to direct a gas through said cover, over said first perforated grid and said second perforated grid, downwardly over said workpiece grid then out of said reactor.

4,348,981

VERTICAL TYPE VAPOR-PHASE GROWTH APPARATUS

Takatosi Nakanisi, Hachioji; Atsushi Tanaka, and Takashi Udagawa, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 54,949, Jul. 5, 1979, Pat. No. 4,290,385.

This application Jan. 26, 1981, Ser. No. 228,350

Claims priority, application Japan, Jun. 14, 1979, 54-75049

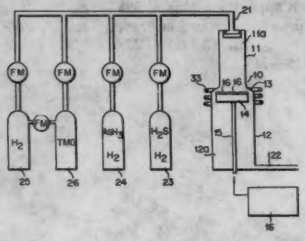
The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.³ C23C *11/00*

U.S. Cl. 118—730 **6 Claims**

1. A vertical type vapor-phase growth apparatus comprising a vapor-phase growth reactor constituted of an upper section defining an upper chamber having a lateral cross-section of below 200 cm^2, a lower section defining a lower chamber having a lateral cross-sectional area greater than, but smaller than four-times the cross-sectional area of, the upper chamber, and a jointing section connecting together the upper and lower sections; a support disposed within the lower chamber and on

which a sample is placed, said upper chamber, jointing section and lower chamber lacking gas flow restrictions therebetween; and means for conducting a gas for vapor-phase growth into the upper chamber of the reactor, wherein said support is provided within the lower chamber and near the upper chamber such that an area of a gap as defined between the outer peripheral surface of the support and the inner surface of the reactor and taken in the minimal cross-sectional direction of the gap is made equal to, or smaller than, the lateral cross-sec-



tion of the upper chamber, wherein said means for conducting a gas into the upper chamber of the reactor comprises gas supply means, a gas introducing duct for supplying the gas from said gas supply means into the upper chamber of the reactor, and gas diffusion means for diffusing the gas from said gas introducing duct, wherein the upper and lower chambers of the reactor are provided concentric with the support, and wherein said support has a silicon plate upon which a sample is directly placed.

4,348,982

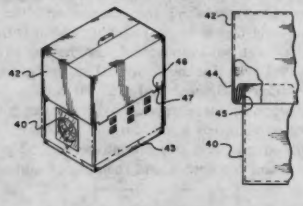
DISPOSABLE CAT RELIEF CHAMBER

Jonathan W. Selby, P.O. Box 103, Telford, Pa. 18969

Filed May 5, 1980, Ser. No. 146,235

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—1 **5 Claims**



1. A totally enclosed cat relief chamber comprising:

a lower box shaped portion including a bottom and upstanding side, front and back walls, the top of said lower portion being open;

an upper box shaped portion including a top and downwardly extending side, front and back walls, the bottom of said upper portion being open, the inner dimensions of said upper portion being slightly greater than the outer dimensions of said bottom portion so that said upper portion can be telescoped over said bottom portion;

said upper portion being movable between a lower position wherein the side, front and back walls of said lower portion are substantially covered by said upper portion and a raised position wherein said side, front and back walls of said lower portion are exposed;

means for preventing said upper portion from moving upward past said raised position;

means for locking said upper portion in said raised position, and

a door located in one of said walls, said door being comprised of a material which will open to allow an animal to pass there through and which will then return to its closed position.

4,348,983

METHOD FOR INDUCING SET IN PLANKTONIC BIVALVES

Kenneth L. Cooper, P.O. Box 940, Arcata, Calif. 95521

Filed Sep. 8, 1981, Ser. No. 299,765

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—4 **5 Claims**

1. A method for inducing planktonic bivalves to set on a substrate in seawater, said method comprising adding a sufficient amount of a 1-substituted-3,4-dihydroxybenzene to said seawater to induce such setting.

4,348,984

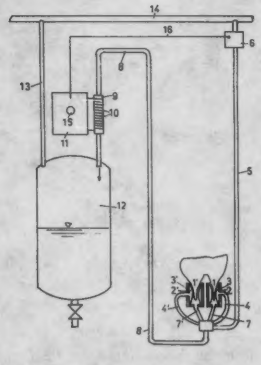
CONTROL APPARATUS FOR MILKING MACHINES

Eyal Brayer, Kfar Monash, Israel, assignor to S.C.R. Engineers Ltd., Nathania, Israel

Filed Sep. 4, 1980, Ser. No. 183,988

Int. Cl.³ A01J *7/00, 5/00*

U.S. Cl. 119—14.08 **7 Claims**



1. A control apparatus for a milking machine which latter is provided with teat cups operated by an electric pulsator, a milk collecting vessel kept at sub-pressure, a pipeline therebetween through which all of the milk from said teat cups flows to said vessel, comprising in combination

a tube of a non-conductive material inserted into the pipe line connecting said teat cups to said milk collecting vessel, said pipe line and said tube being of sufficiently wide dimensions to carry the milk as pulses of milk flowing in separated portions passing through said line and said tube at the rate of the pulsator pulses,

a coil of wire windings surrounding said tube on its outside,

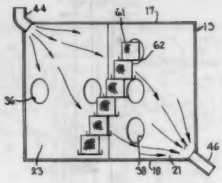
an electronic system including means for applying a high-frequency voltage to said coil, means for detecting the varying amplitude high frequency output signal from said coil indicative of the varying conductivity of the coil interior space due to the milk passing therethrough in pulses, and means for comparing said output signal with a predetermined voltage corresponding to a permissible minimum flow of milk, the system being adapted to interrupt the operation of said electric pulsator, as soon as the output signal reaches the value of said predetermined voltage.

4,348,985

ANIMAL INHALATION EXPOSURE SYSTEM

Basil K. J. Leong, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 22, 1980, Ser. No. 199,420
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—15 **16 Claims**



1. An animal inhalation exposure apparatus for exposing test animals to a test atmosphere, comprising:

a substantially rectilinear boxlike exposure chamber having top, bottom, front and back walls and two opposed side walls, said exposure chamber having funnel-like first and second corner portions converging away from each other, said first funnel-like corner portion being defined by meeting of three of said walls, said second funnel-like corner portion being defined by meeting of the other three of said walls;

inlet means communicating with the interior of said chamber substantially at the apex of said first funnel-like corner portion;

a source of said test atmosphere connected to said inlet means;

outlet means communicating with the interior of said chamber substantially at the apex of said second funnel-like corner portion for the removal of said test atmosphere from said chamber, such that said inlet means and outlet means are about on a maximum length diagonal line across said rectilinear boxlike chamber between said apices, said inlet means and outlet means being remote from the central area and central edge portion of said walls; and

means for effecting a flow of the test atmosphere through the interior of said chamber in a uniform and nonturbulent flow substantially along said diagonal line divergently from said first corner portion apex and convergently toward said second corner portion apex;

a generally planar array of animal cages several cages high and wide through which the mid portion of said diagonal line passes, said array extending transverse to said diagonal line in the widest portion of said enclosure where said oppositely converging first and second corner portions meet, said array of animal cages having a thickness, as measured along said diagonal line, which is small compared to the width and height of said array and which is small compared to the length of said diagonal line, such that the interior of said chamber along the major length of said diagonal line as measured inward from both ends thereof is free of obstructions to said flow, so as to enhance the uniform and nonturbulent nature of said flow through said interior of said chamber.

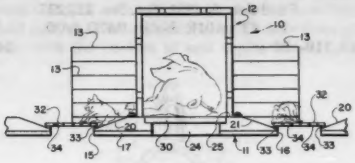
4,348,986

FARROWING PENS

James H. Marrs, P.O. Box 508, Fort Mill, S.C. 29715

Filed Mar. 5, 1981, Ser. No. 240,905
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 **7 Claims**

5. A method of protecting newborn piglets which comprises the steps of confining the mother sow at a first elevation, providing heating means at a second elevation beneath said first elevation and spaced laterally from the confined sow to attract the piglets and warm them, and providing sloping means extending between said first elevation and the second



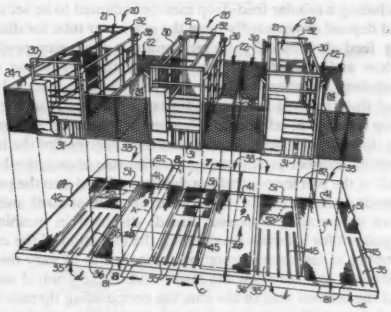
elevation to provide free access for the piglets between the two elevations.

4,348,987

GANG SLAT ANIMAL SHELTER FLOORING WITH FORAMINOUS INSERTS, AND METHOD OF CONSTRUCTING SAME

William T. Herring, P.O. Box 181, Newton Grove, N.C. 28366

Continuation-in-part of Ser. No. 79,484, Sep. 27, 1979, Pat. No. 4,256,057. This application Mar. 13, 1981, Ser. No. 243,510
Int. Cl.³ A01K *1/015, 1/02*
U.S. Cl. 119—20 **22 Claims**



16. A gang slat for use as a floor section in an animal shelter for newborn pigs and adapted to underlie and support thereon a farrowing crate having an elongate central pen for confining therein a sow and elongate side pens extending along opposite sides of the central pen for confining a litter of pigs in close proximity to the sow, said gang slat being formed of reinforced concrete and being of an overall width about equal to the width of a respective farrowing crate and comprising

an elongate concrete central section adapted to support a sow in the central pen of the respective farrowing crate and having openings therein for the passage of animal waste therethrough,

opposing concrete side sections extending along opposite sides of said central section and having elongate side openings therein adapted to accommodate thereover the opposing side pens of the farrowing crate, and

shoulder means at least partially defining the perimeters of the respective elongate side openings and being recessed relative to the upper surface of the gang slat,

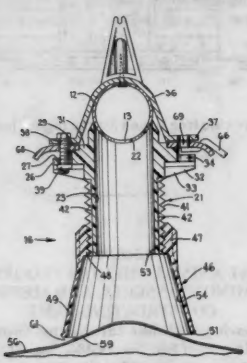
said gang slat being adapted to receive foraminous inserts in said side openings with edge portions of the inserts engagingly supported upon said recessed shoulder means of the respective side openings for forming foraminous flooring to support a litter of pigs thereon in the side pens of a respective farrowing crate.

4,348,988

POULTRY FEEDER WITH INFINITE ADJUSTMENT

John D. Lawson, Leesburg, Ind., assignor to Cyclone International, Inc., Holland, Mich.

Filed Jan. 5, 1981, Ser. No. 222,237
Int. Cl.[3] A01K *39/01*; B67D *3/00*
U.S. Cl. 119—53 14 Claims



1. In a poultry feeding apparatus for mounting on a conveyor tube of a poultry feeding system, said feeding apparatus including a tubular feed-drop member adapted to be secured to and depend downwardly from the conveyor tube for discharging feed downwardly therethrough, a feed pan positioned below and spaced downwardly from the lower end of the feed-drop member for receiving feed therein, and a hollow feed-flow control member adjustably mounted on the feed-drop member in telescopic relationship therewith and projecting downwardly therefrom so that the lower end of the hollow control member is adjustably positionable above the bottom wall of the pan for controlling the flow of feed into the pan, the improvement wherein the feed-drop and control members have cooperating opposed threads disposed in meshing engagement for selectively adjusting the elevation of the control member in response to rotation thereof so as to vary the feed-discharge gap between the lower end of the control member and the bottom wall of the pan, the cooperating threads on the feed-drop and control members creating an interference fit therebetween for securely stationarily holding the control member in its selected adjusted position while permitting selected manual rotation of the control member for adjusting its elevation and hence adjusting said feed-discharge gap, the control member being stationarily maintained in its selected adjusted position solely due to the interference fit created between the threads so that no additional locking or detent structures or devices are required.

4,348,989

ADJUSTABLE WATERER

Darrell D. Vik, 203 N. 8th St., Beresford, S. Dak. 57004

Filed Feb. 25, 1980, Ser. No. 124,453
Int. Cl.[3] A01K *7/06*
U.S. Cl. 119—72 2 Claims

1. An animal watering device comprising:

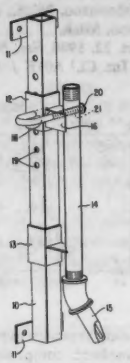
a. a wall-mounted stanchion formed with a plurality of holes,

b. brackets slidably mounted on said stanchion, at least one of said brackets formed to provide a hole,

c. holding means engageable between said one bracket and said stanchion including a "U" shaped pin slidable through said hole in said bracket and into any one of said holes in said stanchion,

d. spring means engaged between said pin and said bracket to bias said pin to the position in which it extends into the hole in the stanchion,

e. water transmitting pipe means vertically mounted on said brackets, and



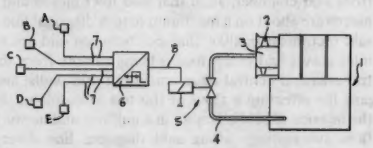
f. a nipple on said pipe means whereby said nipple may be adjusted vertically relative to said stanchion.

4,348,990

APPARATUS FOR REGULATING THE ROTATION OF A HYDRAULICALLY-OPERATED COOLING FAN

Albert Nolte, Cologne; Herbert Schleiermacher, Brühl, and Erich Arbeiter, Plochingen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 190,654, Sep. 25, 1980. This application Nov. 28, 1980, Ser. No. 211,451
Int. Cl.[3] F01D *1/00*
U.S. Cl. 123—41.12 5 Claims



1. In an air-cooled internal combustion engine which includes a hydraulically-operated cooling fan and a hydraulic line circulating fluid to said hydraulically-operated cooling fan to operate said cooling fan, the improvement wherein a regulation apparatus is utilized to control the flow of fluid through said hydraulic line, said regulation apparatus including

an electromagnetic valve connected to said hydraulic line to control the flow of fluid therethrough,

a control unit electrically connected to said electromagnetic valve so as to send an electrical control signal thereto which has a voltage which oscillates from a maximum value to a minimum value, and said control unit being capable of controlling the characteristics of said electrical control signal such that the ratio of time periods during which the voltage thereof is at its maximum value and at its minimum value is changeable,

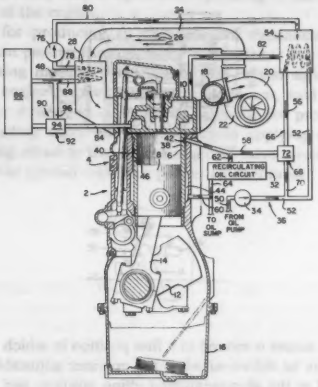
a multiplicity of sensor elements electrically connected to said control unit, said sensor elements being positioned to detect various operational parameters which affect the operation of said engine, the electrical signals from said sensor elements being sent to said control unit to enable said control unit to control the electromagnetic valve to operate such that the amount of fluid passing therethrough will be continuously controlled, the speed of rotation of said cooling fan thus always being maintained at the optimum rate for cooling the engine.

4,348,991

DUAL COOLANT ENGINE COOLING SYSTEM

John H. Stang; David A. Ruthmansdorfer, and Dean H. Reichenbach, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 16, 1980, Ser. No. 197,518
Int. Cl.³ F01P 7/14; F02B 29/04
U.S. Cl. 123—41.29 12 Claims



12. A temperature control apparatus for an air breathing internal combustion engine having a cylinder block, a compressor for pressurizing engine intake air, and an aftercooler for modifying the temperature of the pressurized intake air as it passes into the engine, said temperature control apparatus comprising:

(a) first fluid circuit means for passing first coolant in heat exchange relationship with one or more engine cylinders to provide the primary coolant for the engine cylinders, said first circuit means including first control means for maintaining the temperature of the first coolant at a first level which is relatively constant for substantially all engine operating conditions; and

(b) second fluid circuit means for passing secondary coolant distinct from the first coolant through the aftercooler in heat exchange relationship with the pressurized intake air, said second circuit means including second control means responsive to a control signal for controlling the temperature of the pressurized intake air supplied to the engine by modulating the temperature of the secondary coolant supplied to the aftercooler in proportion to engine output torque, said second control means including signal generating means for producing said control signal in response to an operating condition of the engine indicative of engine output torque to cause the intake air to be cooled by the aftercooler to its lowest temperature at maximum engine output torque and to be heated by the aftercooler to its highest temperature at minimum engine output torque.

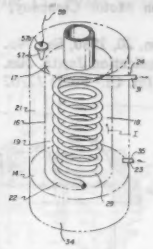
4,348,992

ENGINE BLOCK HEATER

Edward S. Southard, 1101 W. Pine St., Lodi, Calif. 95240

Filed Jan. 9, 1980, Ser. No. 110,692
Int. Cl.³ F02M 17/02
U.S. Cl. 123—142.5 R 10 Claims

1. A heater for the coolant in a liquid-cooled internal combustion engine having a block comprising, in combination, an outer casing having a top wall, a bottom wall and a side wall, an inner casing having a top wall, and a side wall defining an interior disposed within said outer casing and provided with an open bottom end, said inner and outer casing defining an annular chamber therebetween, a fluid inlet and a fluid outlet in said outer casing side wall, means connected to said fluid inlet for communicating said annular chamber with the coolant in said engine block, a fluid conduit disposed within said inner casing interior, said fluid conduit having oppositely disposed ends, one of said fluid conduit ends communicating through said inner casing side wall with said annular chamber and the other of said fluid conduit ends communicating directly through said fluid outlet with the coolant in said engine block, whereby



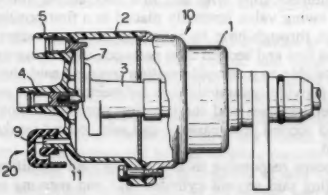
cooling fluid fills said block, said annular chamber and said fluid conduit, heating means disposed adjacent said inner casing open bottom end and means for controlling said heating means for heating the fluid within said fluid conduit whereby heated fluid is circulated from said annular chamber throughout said fluid conduit, to said block and back to said annular chamber.

4,348,993

WATER PROTECTING CAP FOR VENTILATION OPENING OF DISTRIBUTOR

Kazunori Ueno; Masahiro Isobe, both of Toyota, and Setsuo Hoshi, Hino, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 4, 1980, Ser. No. 156,487
Claims priority, application Japan, Jun. 27, 1979, 54-87863[U]
Int. Cl.³ H05B 1/00; H01H 19/00
U.S. Cl. 123—146.5 A 10 Claims



1. In a distributor for an internal combustion engine comprising a casing formed with a ventilation tower formed with a ventilation opening, a water protecting cap for said ventilation opening to prevent entry of water into said casing through said ventilation opening, said cap comprising a crown portion adapted to be fitted onto said ventilation tower to thereby mount said cap on said ventilation tower, the improvement comprising a ventilation passage formed in said cap having an opening communicating with said ventilation opening at said crown portion at one end of said passage and another air entrance opening at the opposite end of said passage, said cap ventilation passage being formed with at least one substantially right angle turn along its length said cap comprising a tongue portion located in spaced relation to said air entrance opening of said passage, said tongue portion and a juxtapositioned portion of said cap defining a space sheltered from water entry into said space, said air entrance opening being located at substantially the innermost portion of said sheltered space, and said tongue being substantially horizontally disposed below

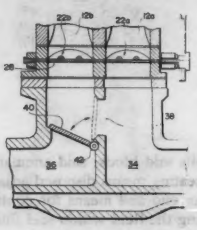
said air entrance opening, whereby water splashed upwardly by a vehicle in which said distributor is mounted is deflected away from said sheltered space by said tongue.

4,348,994

INTERNAL COMBUSTION ENGINE

Toshiaki Tanaka, and Yukihiro Etoh, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 20, 1980, Ser. No. 161,370
Claims priority, application Japan, Jun. 22, 1979, 54-78696
Int. Cl.³ F02D *17/02*
U.S. Cl. 123—198 F 5 Claims



1. An internal combustion engine comprising:
(a) first and second cylinder units each including at least one cylinder;
(b) a carburetor with first and second induction passages each having therein a throttle valve rotatable in phase with the other;
(c) an intake manifold having an inlet passage and first and second intake passages respectively leading to said first and second cylinder units, said inlet passage being divided, by a partition, into first and second inlet passages respectively connected at their upstream ends to said first and second induction passages and respectively connected at their downstream ends to said first and second intake passages, said partition being formed with a through-hole communicating with said first and second inlet passages;
(d) a swing valve normally placed in a first position closing said through-hole to interrupt communication between said first and second inlet passages, said swing valve being rotatable to a second position opening said through-hole to provide communication between said first and second inlet passages and interrupting communication between said second inlet passage and said second intake passage; and
(e) means responsive to low engine load conditions for disabling said second cylinder unit and rotating said swing valve to said second position.

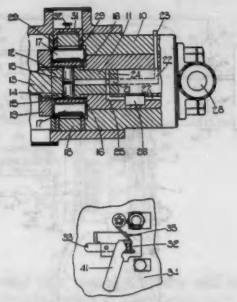
4,348,995

FUEL PUMPING APPARATUS

John R. Jefferson, Rainham, and Alexander G. M. Brown, Maidstone, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 17, 1980, Ser. No. 197,907
Claims priority, application United Kingdom, Nov. 3, 1979, 7938149
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—366 5 Claims

1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising an injection pump operable in use in timed relationship with the associated engine, means for controlling the quantity of fuel delivered by the pump, a two speed governor for determining the setting of said means, said governor including an operator adjustable control which is movable between an engine idling position and a maximum speed position, the governor acting to control the idling speed and the maximum speed of the associated engine, the intermediate speed being determined by the setting of the control, and stop means for determining the maximum amount of fuel which can be supplied by the pump, said stop means being temporarily adjustable to enable an extra or excess amount of fuel to be delivered to the engine for starting purposes, characterised by linkage means connecting said operator adjustable control to said stop means whereby



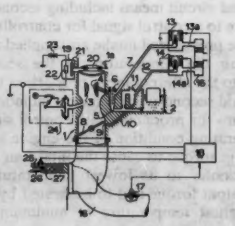
said stop means is moved to a first position in which an excess of fuel can be delivered when the operator adjustable control is moved to the aforementioned idling position, and is moved away from said first position to a second position in which only the normal maximum amount of fuel can be delivered, as the operator adjustable control is moved away from the engine idling position.

4,348,996

SYSTEM FOR CONTROLLING AIR-FUEL RATIO

Takuro Morozumi, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Kanagawa, both of, Japan

Filed Aug. 1, 1980, Ser. No. 174,376
Claims priority, application Japan, Aug. 2, 1979, 54-98923
Int. Cl.³ G06G *7/70*; F02M *7/00, 1/12*; F02B *3/00*
U.S. Cl. 123—440 6 Claims



1. In a system for controlling air-fuel ratio for an internal combustion engine having an intake passage thereto and a throttle valve disposed in the latter, an exhaust passage therefrom, an automatic choke device including a choke valve in the intake passage, a positive temperature coefficient (PTC) heater, and a bimetal element operatively connected to said choke valve, detecting means for detecting the concentration of a constituent of gases passing through said exhaust passage, air-fuel mixture supply means for supplying an air-fuel mixture to the intake passage, an electronic control circuit, and electromagnetic valve means actuated by an output signal from said electronic control circuit for correcting the air-fuel ratio of the air-fuel mixture supplied by said air-fuel mixture supply means, the improvement comprising

a venturi provided in said intake passage upstream of the throttle valve,

a vacuum sensor means for detecting actual flow rate of induced air in said venturi and for providing an electric quantity output signal corresponding to the actual flow rate of induced air in the intake passage,

engine temperature detecting means for providing an electric quantity output signal corresponding to the temperature of the engine,

means for producing an output signal dependent on the current passing through said PTC heater,

calculating means for calculating the output signals from said engine temperature detecting means, said vacuum sensor means and said calculating means for producing a correcting signal and for operatively applying said correcting signal to the electromagnetic valve means to correct the air-fuel ratio to a proper air-fuel ratio.

4,348,997

FUEL INJECTION TYPE CARBURETOR

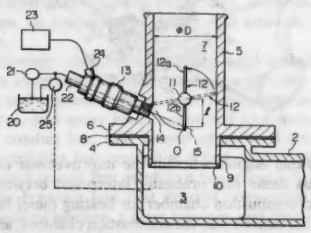
Keiso Takeda; Shozo Inouye, and Toshimi Kashiwakura, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 31, 1980, Ser. No. 174,142

Claims priority, application Japan, Aug. 1, 1979, 54-97211

Int. Cl.³ F02M *61/14*

U.S. Cl. 123—445 **3 Claims**



1. A fuel injection type carburetor of a multicylinder internal combustion engine comprising:

an intake manifold comprising a plurality of horizontal intake passages;

a throttle body connected to a converging portion of said intake manifold;

a throttle valve having a pivot axis installed within said throttle body; and

a fuel injector having a nozzle for injecting fuel in a direction defined by a center axis of said nozzle arranged downstream from the pivot axis of said throttle valve in a manner such that injected fuel can impinge against at least a part of said throttle valve,

in which an opening direction of a valve portion of said throttle valve which can be intersected by said center axis and against which portion the injected fuel impinges is substantially the same as the direction of the fuel injection from said fuel injector, and in which said fuel injector is disposed so that the direction of its nozzle is substantially the same as the direction of air flow through said horizontal intake passages of said intake manifold.

4,348,998

FUEL INJECTION PUMP

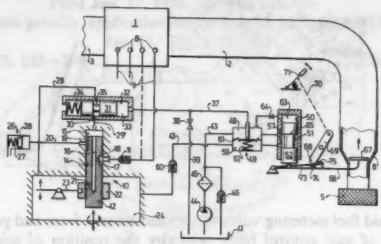
Gerhard Stumpp, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,862

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703685

Int. Cl.³ F02M *59/34*

U.S. Cl. 123—447 **17 Claims**



1. A fuel injection pump for an internal combustion engine which comprises:

a fuel sump;

a pump cylinder;

a steplessly variable throttle means connecting said pump cylinder to said fuel sump, for controlling the flow of fuel from said pump cylinder to said fuel sump;

pump intake means for admitting fuel into said pump cylinder from said fuel sump;

pump outlet means for admitting fuel into said internal combustion engine from said pump cylinder;

a piston movably disposed in said pump cylinder for drawing fuel from said sump into said cylinder through said pump intake means and for expelling the fuel from said cylinder under pressure through said pump outlet means and said variable throttle means, wherein said variable throttle means connects said pump cylinder to said fuel sump in a manner that cannot be disturbed by operation of said piston; and

a relief valve for pressure-relieving said cylinder at a variable point of the stroke of said piston, said relief valve determining the length of the piston stroke during which fuel may be supplied to the engine, and thereby determining a maximum fuel quantity supplied to the engine when said variable throttle means is completely closed; and

adjustment means connected to said variable throttle means for continuous, uninterrupted adjustment of said variable throttle means during operation of the engine, said adjustment means determining the fuel quantity supplied to the engine independently of the relief valve, up to said maximum fuel quantity.

4,348,999

APPARATUS FOR MIXTURE FORMATION FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR MIXTURE-COMPRESSING ENGINES HAVING EXTERNALLY SUPPLIED IGNITION

Siegfried Holzbaur, Stuttgart; Horst Barth, Asperg, and Josef Osmera, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 12, 1980, Ser. No. 177,339

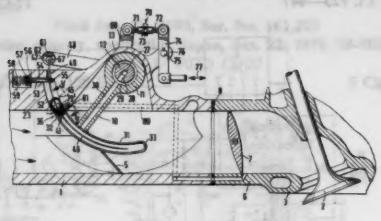
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934216

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—452 **19 Claims**

1. In an apparatus for mixture formation for internal combustion engines, including at least one air intake tube, a fuel metering valve and an air flow rate meter having at least one control

body which includes front and rear end portions and which is arranged to block an intake tube cross section in its outset position and to deflect counter to a restoring force in accordance with the air flow to the cylinders of the engine, thereby opening said intake tube cross section to a greater or lesser extent, said control body deflection arranged to directly control said fuel metering valve, the improvement wherein:



said fuel metering valve is disposed on said front end portion of said control body whereby the position of said fuel metering valve in the intake tube cross section varies in accordance with the position of said control body; and

said apparatus further comprises fuel ejection means, which is disposed on the control body adjacent to, and directly downstream of said fuel metering valve for ejecting fuel metered by said fuel metering valve.

4,349,000

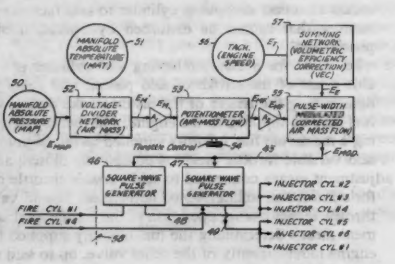
CONTROL MEANS FOR FUEL INJECTION IN AN INTERNAL COMBUSTION ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 120,467, Feb. 11, 1980. This application May 20, 1980, Ser. No. 151,623

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—491 **8 Claims**



1. Electronic pulse-generating means for timing the solenoid-excitation of a fuel-injection solenoid valve in an internal-combustion engine, said pulse-generating means including an input connection for pulse-initiating response to a predetermined angle event in a cycle of the engine, said pulse-generating means including a pulse-width modulating means and control circuit means having a control-signal connection to said modulating means for varying the pulse width generated by said pulse-generating means in accordance with a continuously evaluated plurality of electrically sensed parameters; said parameters specifically including inlet-air absolute temperature, inlet-air absolute pressure, throttle setting, and engine speed, and said parameters being normally evaluated for a predetermined fuel-air relation for normal running of the engine; said control-circuit means including a leaky storage device having a charging connection responsive only to engine-starting and in transient fuel-enriching relation with said pulse-generating means for transiently increasing pulse-width output of said pulse-generating means only upon engine-starting, said storage device including means for charging the same in inverse relation to sensed inlet-air absolute temperature the degree of fuel-enrichment decreasing to zero with charge leakage from said storage device at a rate dependent upon said sensed inlet-air absolute temperature, said decreasing rate being independent of engine starting versus engine running conditions, whereby upon cranking to start engine, the storage device is charged to an extent appropriate for the fuel-enriched starting requirement at the sensed inlet-air temperature, and, once started, the engine runs at progressively reducing enrichment until normal lean-mixture running condition is achieved upon full discharge of said storage device.

4,349,001

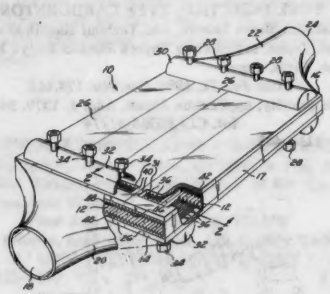
COMPACT DIESEL FUEL PREHEATER ELEMENT

William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 5, 1980, Ser. No. 144,820

Int. Cl.³ F02M *31/02*

U.S. Cl. 123—557 **6 Claims**



1. A diesel engine wherein the improvement comprises a single pass diesel fuel preheater interposed between the fuel pump and combustion chamber for heating diesel fuel prior to its being introduced into the combustion chamber, and wherein said diesel fuel preheater comprises:

a hot fluid chamber having first and second open ends and closed perimeter;

a hot fluid inlet manifold having an inlet port and means for connecting said inlet manifold to said first open end of said hot fluid chamber;

a hot fluid outlet manifold having an outlet port and means for connecting said hot fluid outlet port to said second open end of said hot fluid chamber;

a heat exchanger plate having:

one panel for each cylinder of said diesel engine and wherein each panel comprises at least x number of channels and x−1 number of lands where x is an integer ≧1, a.d a fuel panel inlet and outlet port located at opposite ends of and passing transversely through said panel;

a fuel inlet manifold having at least one fuel inlet and means for connecting said fuel inlet manifold to each fuel panel inlet port; and

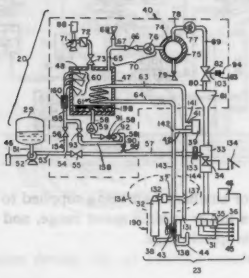
a fuel outlet manifold having at least one fuel outlet and means for connecting said fuel outlet manifold to each fuel panel outlet port.

4,349,002

INTERNAL COMBUSTION ENGINE FUEL TREATMENT APPARATUSES AND PROCESS

Wesley H. Allen, Rte. 5, Box 84, Amarillo, Tex. 79118

Filed Jan. 21, 1981, Ser. No. 226,934
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 11 Claims



1. In a vehicle comprising a liquid cooled gasoline fuel internal combustion engine with a cooling system and fuel system, and a frame, said engine and a passenger compartment mounted on said frame, and a radiator operatively attached to an engine block of said engine by coolant conduits connected to and extending between said radiator and said engine block, the improvement which comprises a fuel treatment apparatus incorporated into the cooling system and fuel system of said internal combustion engine, said fuel system comprising a fuel tank, a fuel pump and a carburetor, said fuel tank connected to said fuel pump, said fuel pump connected by a first conduit to said carburetor, said carburetor connected to said engine block;

said fuel treatment apparatus comprising, in operative combination, an evaporator chamber, four conduits and four valves,

said evaporator chamber comprising rigid chamber walls and an evaporator chamber therein, a plurality of spray heads and coolant conduit coils within said evaporator chamber, said spray heads connected to a second, spray head, conduit line, said second spray head conduit line connected to a first conduit at a first conduit connection connected to said first conduit, a first valve in said second conduit between said first conduit connection and said evaporator chamber, a filter between said first valve and said evaporator chamber,

a third, liquid discharge, conduit connected to the bottom of said evaporator chamber and a fourth, vapor discharge, conduit connected to said evaporate chamber near to the top of said chamber,

said third, liquid discharge, conduit connected to the inlet of a second pump, said second pump operatively connected to said engine block, a discharge conduit of said second pump connected at a second conduit connection attached to said first conduit through a second valve and to said second, spray head, conduit at a third conduit connection located between said first valve and said filter,

a third valve in said first conduit, said third valve located between said first conduit connection and said second conduit connection,

a fourth valve in said fourth conduit, said fourth, vapor discharge, conduit connected to an intake of said carburetor, said fourth valve located between said carburetor and said evaporator chamber,

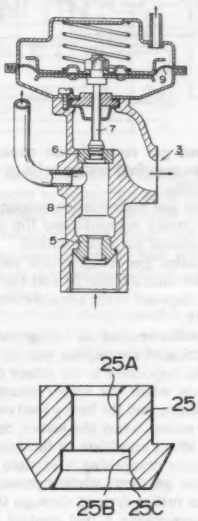
liquid conduits for coolant connected to and extending between said engine block and said coolant conduit coils in said evaporator chamber and also connected to and extending between said engine block and said radiator, and control means for each of said valves in said passeger compartment.

4,349,003

EXHAUST GAS RECIRCULATION CONTROL VALVE

Yoshihiko Masuda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 17, 1980, Ser. No. 160,324
Claims priority, application Japan, Jun. 29, 1979, 54-89923[U]
Int. Cl.³ F02M 25/06
U.S. Cl. 123—568 3 Claims



1. An exhaust gas recirculation control valve provided in a passageway through which an exhaust gas of an engine is recirculated into an intake air-fuel mixture, said exhaust gas recirculation control valve comprising:

a valve orifice member with a through hole defining a pass; and

a valve body to open or close said pass;

said pass comprising in the following order from downstream to upstream:

a tapered seat tapering toward upstream for receiving said valve body to contact sealingly with said valve body;

a cylindrical minimum diameter portion with a same diameter of an upstream end of said tapered seat;

a stepped portion perpendicular to the minimum diameter portion facing upstream for collecting deposits;

a cylindrical pass with a diameter greater than the diameter of said cylindrical minimum diameter portion; and

a frusto-conical pass tapering toward downstream, the downstream end of said frusto-conical pass having a same diameter as said cylindrical pass,

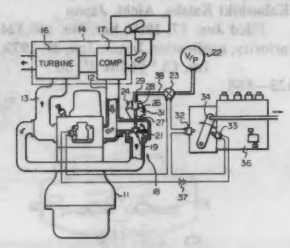
whereby deposits from said exhaust gas are concentratingly attached to the stepped portion so that the deposits on the inner surface of said cylindrical minimum diameter portion, on said stepped portion, on the inner surface of said cylindrical pass and on the inner surface of the frusto-conical pass define a pass with a gradually increasing inner diameter in an upstream direction.

4,349,004

EXHAUST GAS RECIRCULATION APPARATUS FOR DIESEL ENGINE

Hiroshi Matsuda, Sakado, Japan, assignor to Nissan Diesel Kogyo Kabushiki Kaisha, Ageo, Japan

Filed Oct. 22, 1980, Ser. No. 199,413
Int. Cl.³ F02M 25/06
U.S. Cl. 123—569 1 Claim



1. An exhaust gas recirculation apparatus for an engine having an intake manifold and an exhaust manifold, characterized by comprising:

a first exhaust gas recirculation passageway connected between the intake manifold and the exhaust manifold for constant exhaust gas recirculation;

a second exhaust gas recirculation passageway connected between the intake manifold and the exhaust manifold;

valve means disposed in the second exhaust gas recirculation passageway;

sensor means for sensing an idling condition and a heavy load condition of the engine; and

control means responsive to the sensor means for closing the valve means when the sensor means senses one of the idling condition and the heavy load condition and opening the valve means when the sensor means does not sense either the idling condition or the heavy load condition;

the valve means comprising a vacuum operated valve, the first exhaust gas recirculation passageway being constituted by an orifice formed through the valve;

the engine comprising a fuel control member, the sensor means comprising switch means actuated by the fuel control member, the valve being entirely controlled by electrical signals from the switch means.

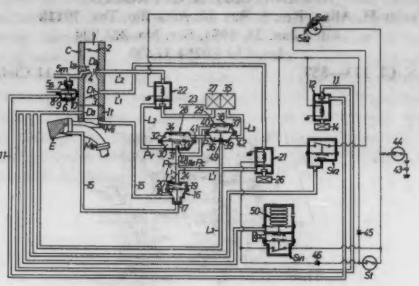
4,349,005

SUCTION MIXTURE CONTROL SYSTEM FOR VEHICLE ENGINES

Osamu Gotoh, Kurume; Yutaka Otobe, Niiza; Michio Kawamoto, Tokyo, and Akira Fujimura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,222
Claims priority, application Japan, Feb. 2, 1980, 55-11761
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 7 Claims

1. A mixture control system for an internal combustion engine for a vehicle, the engine having an intake passage with a pressure responsive auxiliary fuel supply means, and having an exhaust gas recirculation passage, the improvement comprising, in combination: a flow regulating valve in the exhaust gas recirculation passage, said regulating valve being responsive to suction pressure in the engine intake passage, a first control valve for limiting suction pressure applied from said intake passage to said regulating valve, a second control valve for operating the pressure responsive auxiliary fuel supply means, first and second vehicle speed sensors connected to said first and second control valves, respectively, the first vehicle speed sensor being responsive to a relatively high vehicle speed, the second vehicle speed sensor being responsive to a relatively low vehicle speed, whereby said regulating valve and said auxiliary fuel supply means are controlled in a manner such that the flow rate of exhaust gas being recirculated and



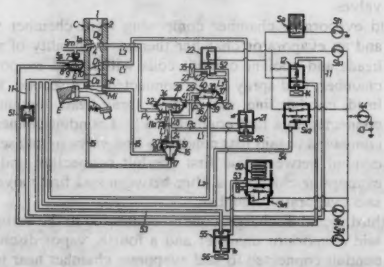
the quantity of auxiliary fuel being supplied to the engine are increased in a lower vehicle speed range, and decreased in a higher vehicle speed range.

4,349,006

SUCTION MIXTURE CONTROL SYSTEM FOR VEHICLE ENGINES

Osamu Gotoh, Kurume; Yutaka Otobe, Niiza; Michio Kawamoto, Tokyo, and Akira Fujimura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,223
Claims priority, application Japan, Feb. 2, 1980, 55-11762
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 5 Claims



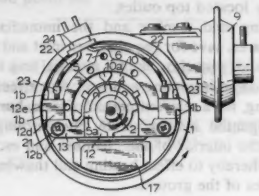
1. A suction mixture control system for an internal combustion engine for a vehicle, the engine having an intake passage with a pressure responsive auxiliary fuel supply means, and having an exhaust gas recirculation passage, the improvement comprising, in combination: a flow regulating valve in the exhaust gas recirculation passage, said regulating valve being responsive to suction pressure in the engine intake passage, a first control valve for limiting suction pressure applied from said intake passage to said regulating valve, a second control valve for operating the pressure responsive auxiliary fuel supply means, vehicle speed and engine operation sensors connected to said control valves, a switch operated by an atmospheric pressure sensor and operatively connected to said control valves, whereby said regulating valve and said auxiliary fuel supply means are controlled in a manner such that the flow rate of exhaust gas being recirculated and the quantity of auxiliary fuel being supplied to the engine are decreased when the atmospheric pressure is below a predetermined magnitude.

4,349,007

INTERNAL COMBUSTION ENGINE IGNITION DEVICE

Masayoshi Onishi; Shinichi Nobuto; Takashi Kawakami, and Shigemi Yamamoto, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 90,310, Nov. 1, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,660
Claims priority, application Japan, Jun. 29, 1979, 54/83671
Int. Cl.³ F02P 1/00
U.S. Cl. 123—617 2 Claims



1. An ignition device for an internal combustion engine comprising:

a housing of a heat dissipating material;

a magnetically permeable rotary shaft journalled in said housing;

a magnetically permeable signal rotor mounted on said rotary shaft and having a plurality of protrusions thereon corresponding to the number of cylinders in the engine;

a magnetically permeable stator mounted on said housing and having a cross-sectional shape of part of an annulus and extending circumferentially around a part of said plurality of protrusions, the number of said protuberances being at least one less than the number of said protrusions, a signal unit around said shaft and including a signal coil extending around said shaft, said stator extending axially of said shaft along the radially outer portion of said signal coil and then radially inwardly toward said shaft and including a magnet means therein, said stator and magnet means and said shaft and said signal rotor forming a flux path around said coil, the cross-sectional shape of said housing being that of a full circle corresponding to the peripheral shape of said stator and being only slightly larger than the peripheral shape of said stator, the portion of said interior of said housing not occupied by said stator having a cross-section substantially segment-shaped and constituting an ignition unit receiving space; and

a substantially segment-shaped ignition unit fixed within said housing in said ignition unit receiving space and connected to said signal unit for applying ignition voltages in response to said ignition signals.

4,349,008

APPARATUS FOR PRODUCING SPARK IGNITION OF AN INTERNAL COMBUSTION ENGINE

Basil E. Wainwright, 80 Greenaleigh Rd., Yardley Wood, Birmingham B14 4JE, England

Filed Nov. 9, 1979, Ser. No. 93,135
Int. Cl.³ F02P 1/00
U.S. Cl. 123—620 21 Claims

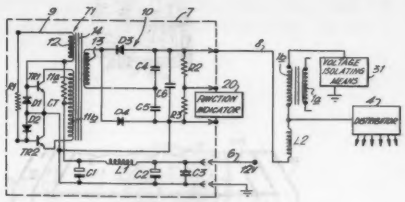
1. Apparatus for producing spark ignition of an internal combustion engine wherein combustion is effected by means of a spark plug in a combustion chamber of the engine, comprising:

(a) spark pulse generating means for applying repetitively to the spark plug an electrical pulse capable of initiating a spark across the spark plug; and

(b) d.c. to d.c. converter means for producing a continuous constant output voltage for application to the spark plug to sustain the spark, said converter means comprising:

(1) a step up transformer having primary, secondary and feedback windings, and a saturable core;

(2) oscillator means including a pair of semiconductor switching means coupled to said primary winding and to said feedback winding and operable to produce an oscillatory current flow in said primary winding, thereby to induce an oscillatory stepped up voltage in said secondary winding, said oscillator means including a resistor (R1) connecting one end of said feeback winding with the base electrode of one of said semiconductor switching means, the other end of said feedback winding being directly connected with the base electrode of the other of said semiconductor switching means, said resistor being operable to adjust the point at which the



bases of the semiconductor switching means no longer saturate, thereby to define the maximum value of current (22) beyond which operation of the oscillator means is automatically terminated; and

(3) rectifying means coupled to said secondary winding for producing a rectified output voltage for application to the spark plug;

(4) said converter means being operable upon short circuit of said output voltage to ground to damp said oscillator means and thereby cease operation of said converter means.

4,349,009

COMBUSTION AIR SYSTEM

Eddy L. Patterson, and George D. Patterson, both of McKinney, Tex., assignors to Overhead Door Corporation, Dallas, Tex.

Filed Mar. 3, 1980, Ser. No. 126,740
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 20 Claims

15. A fireplace assembly, comprising:

(a) firebox means defining a combustion chamber;

(b) a hood section disposed over said firebox means;

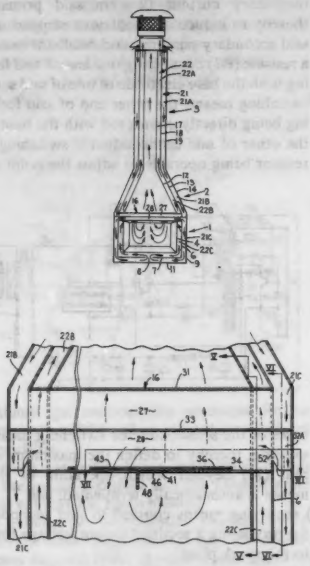
(c) a flue section disposed over said hood section and including an elongated flue pipe open at its top end for conducting combustion gases from said combustion chamber for discharge to the atmosphere through said top end; and

(d) thermal siphoning flow means for circulating air around the periphery of said firebox means and flue section to provide a barrier to heat flow from the firebox means and flue section to materials disposed adjacent said fireplace assembly, and for enabling only a portion of said circulating air to be introduced into said combustion chamber,

said thermal siphoning means comprising shell means surrounding the firebox means, the hood section, and the elongated flue pipe and defining outer and and inner adjacent elongated air passageways open to the atmosphere only at their upper ends; and

(e) conduit means between said shell means and said combus-

tion chamber through which only a portion of said circulating air flows into said combustion chamber at the top



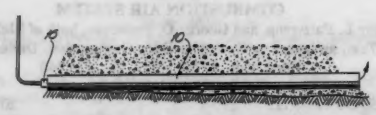
thereof with the major portion of said circulating air flowing through said elongated passageways.

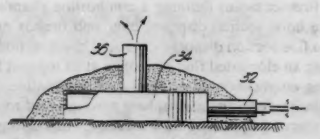
4,349,010

FROST REMOVAL SYSTEM

Thomas J. Bentham, c/o AgWest Industries, Ltd., P.O. Box 56, Headingly, Manitoba, Canada

Filed Feb. 11, 1980, Ser. No. 120,322
Claims priority, application Canada, Nov. 14, 1979, 339862
Int. Cl.³ F23C *5/00*; E02D *3/00*
U.S. Cl. 126—271.1 **10 Claims**





1. A method for removing frost from a selected area of ground comprising:

(a) positioning a plurality of hollow pipes over the area to be thawed, each pipe having an inlet and an exhaust end;

(b) covering said pipes and the immediately adjacent ground areas to substantially surround said pipes, save for the inlet and exhaust ends of the pipes, with a bed of sand, gravel or equivalent fill materials to a selected depth to provide a heat insulating and heat sink effect, and

(c) directing, for a selected period of time, burning gases along the lenth of each pipe from a plurality of burners each being disposed at the inlet end of a respective one of the pipes, and allowing the heated gases to travel along the lengths of the pipes and to escape from their exhaust ends whereby to effect heating of and thawing of said selected area of ground.

10. A method of removing frost from a relatively confined area of ground as where a post hole is to be formed comprising:

(a) positioning a generally circular chamber over said area, which chamber has a tangential inlet, and a generally centrally located top outlet;

(b) covering said camber and the immediately adjacent ground area, save for the chamber inlet and outlet, with a bed of sand, gravel or like fill material to a selected depth to provide an insulating and heat sink effect, and

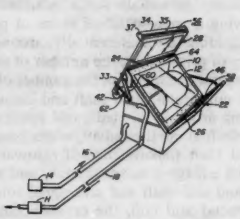
(c) directing, for a selected period of time, buring gases into said tangential inlet whereby the burning gases swirl around the interior of the chamber and escape from the outlet whereby to effect heating and thawing of said confined area of the ground.

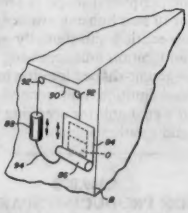
4,349,011

SOLAR OPERATED SHUTTER

Clarence E. Hartsog, 570 S. 9th St., Modesto, Calif. 95351

Filed May 22, 1981, Ser. No. 266,250
Int. Cl.³ F24J *3/02*; E05F *15/20*; F02L *5/00*
U.S. Cl. 126—419 **11 Claims**





1. A solar collector system comprising:

an insulated enclosure having a light transmissive surface and housing a fluid container having a highly absorptive surface for collection of radiant energy from sunlight passing through said light transmissive surface;

a first tank substantially thermally uninsulated and adapted to be exposed to sunlight;

a second tank including a layer of thermal insulation covering a substantial portion thereof, said second tank movable between an upper level and a lower level;

tube means fluidly connecting said first and second tanks;

a partially vaporized fluid contained within said first and second tanks and said tube means;

a first insulating panel movably mounted adjacent said light transmissive surface between first and second positions, said first position at least partially covering said light

transmissive surface and said second position substantially removed from said light transmissive surface; and

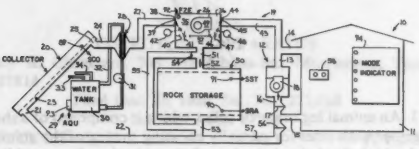
means for operably coupling said second tank and said first panel so that movement of a portion of said partially vaporized fluid between said first and second tanks through said tube means due to differential pressures within said tanks caused by temperature differences between the interiors of said first and second tanks causes said second tank to move between said upper and lower levels thereby moving said first panel between said first and second positions.

4,349,012

SOLAR HEATING CONTROL

Richard J. Schildknecht, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Jan. 11, 1980, Ser. No. 111,340
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **3 Claims**



1. A control to operate a solar heating system and an auxiliary heating system to selectively supply heat to an enclosure in response to the operation of a thermostat having a first output circuit selectively providing a first stage heat signal and a second output circuit selectively providing a fan signal, said control comprising means sensing the temperature of the solar heating system to provide a temperature indicative signal, a first gatable semiconductor having a first circuit connected to said first output circuit through first switch means including a first manually operable switch and a second circuit connected to the auxiliary heat system through a first current limiting resistor and a first fuse, a second gatable semiconductor having a first circuit connected to said second output circuit through second switch means including a second manually operable switch and a second circuit connected to the auxiliary heat system through a second current limiting resistor and a second fuse, and transfer means operatively connected to said temperature sensing means and to first and second gate inputs of said first and second semiconductors, respectively, to selectively render said first and second semiconductors conductive in response to said temperature signal of a predetermined magnitude to conduct the first stage heat signal and the fan signal from the thermostat to the auxiliary heat system to operate the auxiliary heat system.

4,349,013

SOLAR ENERGY RECEIVERS

Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio

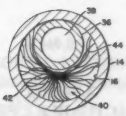
Continuation-in-part of Ser. No. 52,085, Jun. 25, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 275,841
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—442 **7 Claims**

1. A solar energy receiver comprising:

an elongated tubular heat conductive element having a portion of its exterior adapted to be exposed to solar radiation, said tubular element having a through passage for flowing fluid which is heated by heat transfer from said element;

an elongated flow directing element positioned within said passage and against the passage wall that is away from the portion of the tubular element struck by solar radiation thereby directing fluid flow only adjacent the portion receiving heat from reflected solar radiation; and

an elongated element comprising an elongated core extending through said passage in a direction generally parallel



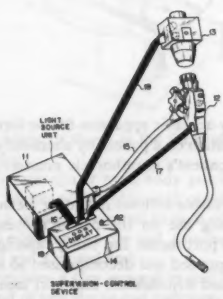
to fluid flow and a plurality of tines extending outward from said core that they generally extend across the flow path of fluid thereby promoting turbulence; whereby heat transfer to said fluid is maximized.

4,349,014

ENDOSCOPE SYSTEM

Takeshi Takamatsu, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,609
Claims priority, application Japan, Oct. 2, 1979, 54-127004
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **7 Claims**



1. An endoscope system comprising:

an endoscope including a light guide; an image guide; an eyepiece section; and an endoscope connection signal generator for generating an endoscope connection signal;

a light source unit including a light source for conducting light to the light guide of the endoscope; and a light source unit connection signal generator for generating a light source unit connection signal;

a photographic attachment including means for connection to the eyepiece section of the endoscope to photograph a coeliac cavity; and a photographic attachment connection signal generator for generating a photographic attachment connection signal;

a centralized supervision-control unit for supervising and

controlling the operation and interaction of the endoscope, light source unit and photographic attachment with respect to each other; and

signal transmission lines for electrically connecting the centralized supervision-control unit to the endoscope, to the light source and to the photographic attachment to thereby transmit the respective connection signals to the centralized supervision-control unit and to perform data-transmission between the centralized supervision-control unit and the endoscope, light source unit and photographic attachment, said centralized supervision-control unit supervising and controlling in response to the connection signals the operation and interaction of the endoscope, light source and photographic attachment.

4,349,015

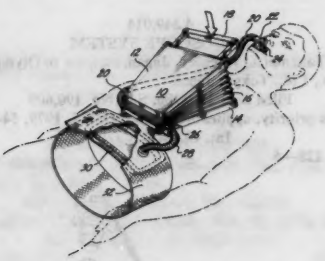
MANUALLY-ACTUABLE CPR APPARATUS

Clifton A. Alferness, Woodinville, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Nov. 14, 1980, Ser. No. 206,576

Int. Cl.³ A61H *31/00*

U.S. Cl. 128—28 **16 Claims**



1. A manually-actuable apparatus for performing cardiopulmonary resuscitation on a patient by alternately increasing and decreasing the patient's intrathoracic pressure, said apparatus comprising:

a manually-actuable bellows including means adapted to be placed during use on the patient's chest, said bellows including a port means and being capable of being alternately compressed and decompressed so as to alternately pressurize and depressurize said port means and so as to alternately apply force to and remove force from the patient's chest;

an airway apparatus including means adapted to be placed during use in proximity to the patient's airway so as to couple gas to and from the patient's lungs; and,

first means for providing a fluid flow path between said port means of said bellows, said airway apparatus, and a source of gas at atmospheric pressure, said first means including a first valve apparatus which is operative to limit the pressure in the patient's lungs to a desired pressure value as said port means of said bellows is pressurized during bellows compression and which is further operative to couple gas from the patient's lungs and from the source of gas at atmospheric pressure to said bellows as said port means of said bellows is depressurized during bellows decompression.

4,349,016

LIVESTOCK SPLINT

Stephen M. Glassman; James D. Kis, and Paul A. Ryding, all of Wichita, Kans., assignors to KRG, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 149,269, May 12, 1980, Pat. No. 4,320,722. This application Jun. 1, 1981, Ser. No. 269,314

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—87 R **10 Claims**

1. An animal leg brace or splint which is comprised of a shell member with sides for partially encasing the leg of the animal, and which fits behind the leg of the animal; a foam padding means connected to the inside of said shell member to protect the leg of the animal from pressure sores and insure a proper therapeutic fit; a reinforced back means connected to and traversing the back of said shell member to prevent the animal from fatiguing the brace or splint prematurely; said shell member having a carpal section on each of said sides for contiguously resting in proximity to the carpal area of the leg of the animal, said carpal section of each of said sides having a structure generally defined by the residual structure after an essentially U-shaped section is removed from a section of said sides of said shell member to accomodate the joint in the carpal area of the leg of the animal such that further injury to the forelimb of the animal is not incurred.

4,349,017

ORTHOPAEDIC APPARATUS

Antoine Y. Sayegh, Wexham Park Hospital, Wexham Road, Slough, Berkshire, England

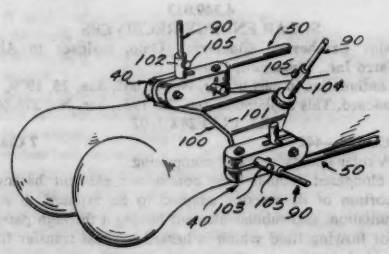
PCT No. PCT/GB79/00055, § 371 Date Nov. 30, 1979, § 102(e) Date Nov. 26, 1979, PCT Pub. No. WO79/00866, PCT Pub. Date Nov. 1, 1979

PCT Filed Apr. 2, 1979, Ser. No. 189,840

Claims priority, application United Kingdom, Mar. 31, 1978, 12608/78; Apr. 28, 1978, 17051/78

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 A **3 Claims**



1. Orthopaedic fracture fixation apparatus comprising:

two similar bone pin clamp assemblies respectively to be

located proximally and distally with respect to a fracture site in a long bone of a limb;

each said clamp assembly including a plate formed to approximate a curved surface generally conforming to the profile of said limb, and said plate having two spaced tubular projections from its generally convex face to guide individual bone pins clamped therein in predetermined mutually perpendicular directions;

two longitudinally adjustable rod mechanisms, each to extend across said fracture site between a separate pair of said projections, a pair being constituted by one projection from each said clamp assembly;

and four coupling mechanisms, each including a pair of clamps, which clamps are independently operable, are rigidly interconnected, and include two guides respectively to secure elongate members in predetermined mutually perpendicular directions;

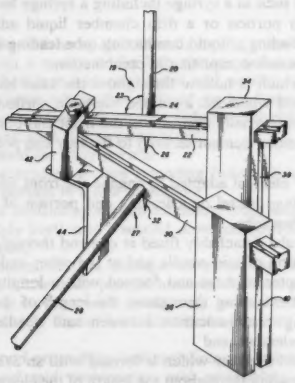
each said coupling mechanism being located at a respective one of said projections to secure in said two guides adjacent portions of said one projection and the associated one of said rod mechanisms.

4,349,018

OSTEOTOMY APPARATUS

Gary R. Chambers, 705 McFarland St., Morristown, Tenn. 37814

Filed Dec. 29, 1980, Ser. No. 221,015
Int. Cl.³ A61B *17/18*
U.S. Cl. 128—92 E **11 Claims**



1. Surgical apparatus useful for both a tibia-femur osteotomy and a proximal tibia osteotomy comprising:

a femur "T" unit including an elongated femur rod having a first and further end and an elongated femur bar having a mid portion and a medial and lateral end, said first end of said rod being securely joined to said mid-portion of said bar to form a substantially "T" shaped unit such that said "T" unit has an angle between said bar and said rod of between 80 degrees and 100 degrees, and said femur "T" unit further includes a femur pin secured to said femur "T" unit for securing said femur "T" unit to a selected bone of a patient such that said elongated rod is parallel to the selected bone and said elongated bar is substantially perpendicular to the selected bone;

a tibia "T" unit including an elongated tibia rod having a first and further end and an elongated tibia bar having a mid-portion, and a medial and a lateral end, said first end of said tibia rod being joined to said mid-portion of said tibia bar to form a "T" shaped unit, said rod and said bar having substantially a right angle there between, and also including a tibia pin secured to said tibia "T" unit for securing said tibia "T" unit to a selected bone of a patient such that said elongated rod is parallel to the selected bone and said bar is substantially perpendicular to the selected bone;

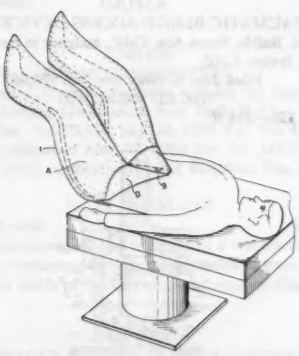
a femur and tibia guide unit, said femur guide unit suitable for guiding an osteotome blade along a first selected plane, and said tibia guide unit suitable for guiding said ostetome blade along a second selected plane, said guide units suitable for being detachably mounted to said femur and tibia bars respectively such that said first and second selected planes intersect the length of a patient's leg at first and second locations respectively, said femur and tibia guide units suitable for mounting to the mid part of said femur and tibia bars for performing an osteotomy for total knee replacement, and suitable for mounting to said medial and lateral ends of said femur and tibia bars for preforming a proximal tibia osteotomy.

4,349,019

SURGICAL LEGGINGS

Wayne J. Singer, Woodstock, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 14, 1981, Ser. No. 283,199
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—132 D **7 Claims**



1. A surgical cover or drape in the form of a loose fitting legging comprising

(a) a generally rectangular main body portion having first and second panels of like size, said panels being longer than they are wide and secured to each other along their longitudinal edges and at one end, forming a sleeve with an open end and a closed end;

(b) a cuff comprising a flap secured to said first panel near said open end of said sleeve and overlying said first panel adjacent to and opening away from said open end of said sleeve;

(c) an abdominal cover comprising a flap secured along one edge to said second panel at said open end of said sleeve, said flap having two opposing edges of unequal length adjacent the edge secured to said second panel, said opposing edges generally parallel to each other and to the longitudinal edges of said main body portion, said flap so constructed and arranged as to provide substantial coverage for the abdominal area of a patient with reduced material at the side of the patient and in the perineal area; and

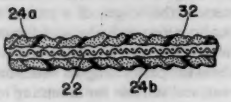
(d) means for securing said abdominal cover to a patient's abdomen or to the corresponding abdominal cover of a second legging.

4,349,020

SHIRRED LAMINATE

William G. Krikorian, Lot #12, Old Dunstable Rd., Groton, Mass. 01450

Filed Sep. 14, 1979, Ser. No. 75,398
Int. Cl.³ A61F 13/00
U.S. Cl. 128—155 12 Claims



1. A self-adhesive bandage for wrapping and maintaining support for animal or human limbs comprising

first and second strips of stretchable elastic polymer,

a third strip of puckered non-elastic scrim formed of a first set of substantially parallel yarns and a second set of substantially parallel yarns extending at an angle to the yarns of said first set, and

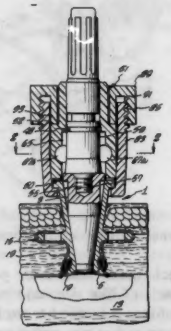
elastic adhesive material binding said strips in face-to-face relationship with said first and second strips on opposite sides of said third strip forming a bandage structure capable of being stretched to a predetermined length limited by said non-elastic scrim.

4,349,021

ATRAUMATIC BLOOD ACCESS DEVICE VALVE

Donald A. Raible, Santa Ana, Calif., assignor to Bentley Laboratories, Irvine, Calif.

Filed Jun. 9, 1980, Ser. No. 158,063
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R 10 Claims



1. An atraumatic valving mechanism for operation within a blood passageway of a blood access device having an external rim, said blood passageway adapted to connect a blood vessel within a body to the body exterior, said valving mechanism comprising:

a plugging means for sealing said blood passageway;

a reciprocable stem member means for connection to said plugging means;

a valve chamber means adapted to be secured to the portion of said blood access device blood passageway at said body exterior, said valve chamber including an aperature through which said reciprocable stem member means for connection to said plugging means may be passed and;

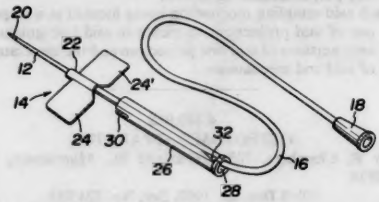
a retaining element and a retaining element ring for engaging therewith for securing said valve chamber means to said blood access device, said retaining element having an aperature for slidably engaging said valve chamber and a restraining shoulder for engaging said blood access device external rim and forcing, from opposed directions, said valve chamber and blood access device together upon engaging said retaining element and retaining element ring.

4,349,022

MEDICAL NEEDLE ASSEMBLY

Soji Ishikawa, No. 6-22, 6-chome, Miyazaki, Takatsu-ku, Kawasaki City, Kanagawa Prefecture, Japan

Filed Jul. 14, 1980, Ser. No. 168,673
Claims priority, application Japan, Aug. 10, 1979, 54-109412[U]; Aug. 20, 1979, 54-114219[U]
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R 15 Claims



1. A needle assembly to form a part of a medical administering device such as a syringe including a syringe barrel having a front tip portion or a drip chamber liquid administering system including a liquid conducting tube leading from a drip chamber vessel, comprising in combination

a needle which is hollow throughout the axial length of the needle and which has a pointed front end portion and a rear end portion axially opposite to the front end portion,

a needle holder element secured to the rear end portion of the needle,

an adapter element adapted to engage the front tip portion of said syringe barrel or a leading end portion of said liquid conducting tube,

a flexible tube detachably fitted at one end thereof to the rear end portion of said needle and at the other end thereof to said adapter element and formed with a longitudinal passageway extending throughout the length of the tube and providing communication between said needle and said adapter element, and

an elongated member which is formed with an axial passageway extending throughout the length of the elongated member and having said flexible tube loosely passed therethrough and which is engageable with said needle holder element through a front end portion of the axial bore in the elongated member,

said needle holder element having a generally tubular portion having the rear end portion of the needle securely passed therethrough in the axial direction of the tubular portion and said elongated member being engageable with said tubular portion of the needle holder element in the vicinity of the rear end portion of said needle,

said needle holder element further having a pair of flexible side strip portions laterally projecting in opposite directions from said tubular portion of the needle holder element and said elongated member being engageable with said side strip portions as well as said tubular portion of the needle holder element,

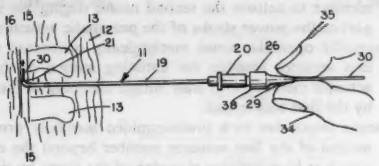
wherein said elongated member has a front end portion formed with a pair of axial grooves which are substantially diametrically opposite to each other across the axial bore in the elongated member and which axially terminate at the foremost end of the elongated member, the elongated member being engageable with said side strip portions of the needle holder element through said grooves, respectively.

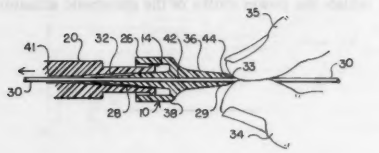
4,349,023

EPIDURAL NEEDLE CATHETER AND ADAPTER

James R. Gross, Bartlett, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 9, 1980, Ser. No. 195,448
Int. Cl.³ A61M 25/00
U.S. Cl. 128—214.4 11 Claims





1. For use with an epidural needle having a needle and hub portion with a cavity in the hub portion and a passageway extending between said cavity and said needle, a device for feeding catheter tubing through said epidural needle into the epidural space while substantially reducing the risk of kinking of the tubing, said device comprising:

an intermediate body portion;

a first protruding section extending from said intermediate body portion in a first direction;

a second protruding section extending from said intermediate body portion in a second direction opposite said first direction;

a continuous, coaxial passageway extending through said intermediate body portion and said first and second protruding sections, said passageway having a diameter approximately the same as the outside diameter of said tubing;

said second protruding section defining an entrance portion adjacent said passageway, said passageway adapted to receive said catheter tubing through said entrance portion in said second protruding section;

said first protruding section constructed and arranged to be received within said hub portion cavity and to provide coaxial alignment between said hub passageway and said first protruding section passageway;

said second protruding section defining a finger engaging orifice surface surrounding said entrance portion and defined by a substantially conical configuration with the smallest diameter portion located adjacent said entrance portion to said passageway;

so that when said first protruding section is inserted into said hub cavity a length of catheter tubing can be easily fed through said epidural needle and into the epidural space.

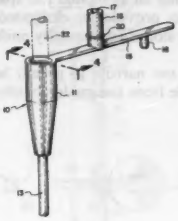
4,349,024

MULTIPLE ADAPTER DEVICE FOR INTERCONNECTING TUBING OF DIFFERENT SIZES

Philip G. Ralston, Jr., 364 N. 835 East, Lindon, Utah 84062

Filed Apr. 1, 1981, Ser. No. 249,818
Int. Cl.³ A61M 3/00
U.S. Cl. 128—247 8 Claims

1. An adapter device for use with at least two different sizes of connectors, comprising a body member having a passage therethrough for accepting a particular size of connector therein; flexible linking means, one end of which is secured to said body member; an adapter member capable of being received by the body member passage, said adapter member having a passage therethrough for accepting a connector of a size different than that accepted by the body passage, said adapter member being secured to the linking means intermediate its length in a manner such that bending of said linking means permits insertion of the adapter member into the body member passage; and plug means capable of being received by the adapter member passage, said plug means being secured to the linking means near that end thereof which is not secured to the body member in a manner such that bending of the linking means permits insertion of the plug means into the adapter member passage.



4,349,025

GLASS COMPOSITION

Cyril F. Drake, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Division of Ser. No. 75,617, Sep. 14, 1979, Pat. No. 4,283,227.
This application Mar. 12, 1981, Ser. No. 243,222
Claims priority, application United Kingdom, Sep. 26, 1978, 38222/78
Int. Cl.³ A61M 7/00
U.S. Cl. 128—260 10 Claims

1. A subcutaneous implant comprising a watersoluble glass composition containing an element releasable in trace amounts into the body fluids of the carrier as the implant dissolves.

4,349,026

REGENERATED FIBER COLLAGEN CONDOM AND METHOD OF PREPARATION

Teruo Miyata, Tokyo, Japan, assignor to Collagen Development Corp., New York, N.Y.

Filed Feb. 28, 1980, Ser. No. 125,538
Int. Cl.³ A61F 5/42
U.S. Cl. 128—294 4 Claims

1. As an article of manufacture a condom consisting of an isotropically-strong membrane of crosslinked regenerated, fiber collagen.

4,349,027

NEEDLE GUIDE FOR IMPLANTING INTRA-OCULAR LENS

John G. DiFrancesco, Lake Drive South, New Fairfield, Conn. 06810

Filed Jun. 23, 1980, Ser. No. 162,013
Int. Cl.³ A61B 17/06
U.S. Cl. 128—303 R 6 Claims

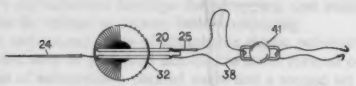
1. A needle guide for intra-ocular surgery to fixate an intra-ocular lens following cataract removal, designed for insertion through a corneal-rim incision into a temporary position spanning the anterior chamber and being thereby positioned to conduct straight surgical needles safely across the anterior chamber and past the corneal endothelium, comprising

an elongated thin narrow substantially flat and rectangular unitary guide plate having

an elongated needle flange inturned and downturned along each elongated edge of the guide plate to form a cylindrical needle guide chamber of substantially uniform cross section dimensioned to embrace a straight surgical needle during its endwise telescoping passage into, through and beyond the guide chamber,

each flange having an elongated rim spaced away from the guide plate to provide an elongated inwardly-opening suture-release slot of substantially uniform width therebetween,

each slot being too narrow to permit lateral removal of a surgical needle from the guide chamber,



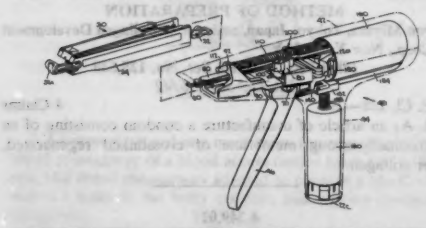
whereby the elongated narrow guide may be inserted spanning the anterior chamber, guided by trans-illumination, a pair of surgical needles secured to opposite ends of a first suture loop and forming a double armed suture interlinked with a retention loop of an intra-ocular lens may be inserted into and moved through the respective guide chambers safely passing the endothelium to exit through the sclera opposite the corneal rim incision, leaving the bight of the first suture loop protruding from the incision, and tension maintained on the first suture loop permits the needle guide to be withdrawn through the incision and detached from the first suture loop by lateral withdrawal of the first suture loop through the suture-release slots, after which the intra-ocular lens may be inserted adjacent to the iris and secured by suturing in position spanning the pupil.

4,349,028

SURGICAL STAPLING APPARATUS HAVING SELF-CONTAINED PNEUMATIC SYSTEM FOR COMPLETING MANUALLY INITIATED MOTION SEQUENCE

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 3, 1980, Ser. No. 190,146
Int. Cl.³ A61B *17/12, 17/32*
U.S. Cl. 128—305 **17 Claims**



1. In apparatus for ligating and dividing body tissue including first means for clamping the tissue in the apparatus and then advancing two spaced staple-like metal ligatures toward the clamped tissue and crimping the ligatures around the tissue, and second means for cutting the tissue between the crimped ligatures, an actuator comprising:

a first movably mounted actuator member for actuating the first means;

a second movably mounted actuator member for actuating the second means;

a pneumatic system including a supply of pressurized gas pneumatically connected to a pneumatic actuator;

a first mechanical linkage for connecting the pneumatic actuator to the first actuator member for moving the first actuator member to actuate the first means during an initial first part of the power stroke of the pneumatic actuator and for holding the first actuator member stationary during a subsequent second part of the power stroke of the pneumatic actuator;

a second mechanical linkage for connecting the pneumatic actuator to the second actuator member for moving the second actuator member relative to the first actuator member to actuate the second means during the second part of the power stroke of the pneumatic actuator;

manually operable means mechanically connected to the first actuator member for initiating motion of the first actuator member to at least initiate clamping of the tissue by the first means; and

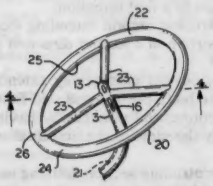
means responsive to a predetermined manually produced motion of the first actuator member beyond the motion which at least initiates clamping of the tissue by the first means for releasing pressurized gas from the gas supply to initiate the power stroke of the pneumatic actuator.

4,349,029

DRAINAGE BALLOON CATHETER SYSTEM

Patricia A. Mott, 103 N. Central, Armstrong, Mo. 65230

Filed Jun. 16, 1980, Ser. No. 160,134
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 B **16 Claims**



1. In an intraurethral retention catheter having a longitudinal axis and being adapted for use in a bladder and having an expansion balloon for selectively maintaining the catheter after insertion within the bladder and at least one drainage aperture providing flow communication between an interior bore of the catheter and the bladder after insertion within the bladder; the improvement comprising:

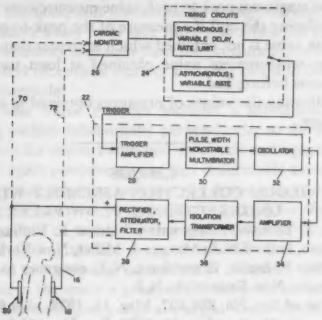
(a) expandable balloon biasing means including at least a first portion thereof radially extending and spaced outwardly and circumferentially from said catheter; and

(b) said aperture being positioned on said catheter such that a plane normal to said catheter longitudinal axis and passing through said aperture also passes generally through said balloon biasing means; said balloon biasing means first portion being spaced radially outward from said aperture; whereby said aperture is adapted to freely communicate with urine within said bladder when said balloon biasing means is expanded and whereby said balloon biasing means is adapted to positively urge walls of the bladder away from the aperture when expanded within the bladder such that the walls do not occlude flow of urine from the bladder through the aperture.

4,349,030
EXTERNAL NONINVASIVE ELECTRIC CARDIAC STIMULATION

Alan H. Belgard, Sharon; Paul M. Zoll, Newton Centre, both of Mass., and Ross H. Zoll, 261 Brookline St., Newton Centre, Mass. 02159, assignors to Ross H. Zoll, Newton Centre, Mass.

Filed Jul. 10, 1980, Ser. No. 168,381
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **22 Claims**



1. An external noninvasive electric cardiac stimulation system comprising

a pair of electrodes having nonmetallic skin-contacting members that provide low current density to reduce stimulation of local sensory nerves and resulting pain,

a pulse generator electrically connected to said electrodes,

said generator including means to provide constant current pulses without high current spikes that cause skeletal muscle contraction,

said pulses being greater than 5 milliseconds in duration to reduce the threshold current required for cardiac stimulation, to permit the use of lower current pulses to provide effective stimulation at the same time that skeletal muscle contraction is reduced by the lower current, and

means to activate said pulse generator to provide said current pulses.

4,349,031
ESOPHAGEAL PROBE WITH DISPOSABLE COVER

Alfred R. Perlin, Highland Park, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 7, 1980, Ser. No. 128,323
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—642 **13 Claims**

1. An esophageal probe, comprising:

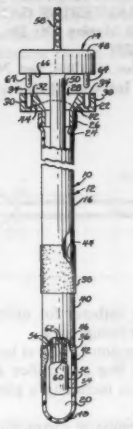
a disposable housing comprising an elongated sleeve defining a cavity having a proximal end, a distal end, and a proximal opening communicating with the cavity, said housing having a sufficient length to extend from the outside of a patient's body into the esophagus of the patient;

a permanent monitoring device having an elongated stem removably receivable through said opening into said sleeve cavity, said stem having a proximal end, a distal end, and means for monitoring a body function of a patient from within the sleeve;

means for releasably attaching said monitoring device to said housing with said stem received in the sleeve cavity, said attaching means comprising a first connector adjacent the proximal end of the monitoring device and a second connector adjacent the proximal end of the housing;

means establishing electrical connection between the first and second connectors when the first and second connectors are attached together;

a pair of spaced electrodes on an outer surface of the sleeve; and

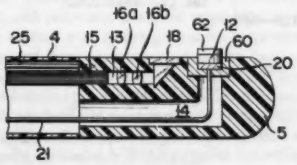


means for electrically connecting the electrodes to the electrical establishing means of the connectors.

4,349,032
ENDOSCOPE WITH AN ULTRASONIC PROBE

Kenzi Koyata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1979, Ser. No. 101,244
Claims priority, application Japan, Dec. 15, 1978, 53-154657
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **6 Claims**



1. An endoscope comprising a control section having an eyepiece section for observation and an operating section, a flexible tube connected at one end to the operating section, a bendable section connected at one end to the other end of the flexible tube, a distal end section provided at the other end of the bendable section, and bending means for bending said bendable section by the operating section, the bending means comprising at least one string member connected at one end to the operating section and fixed at the other end to the distal end section, said distal end section having a viewing window, in which at least one ultrasonic probe is provided at the distal end section, said probe having a vibration absorbing body attached thereto and a directionality in a direction substantially the same as that of an optical axis of the viewing window provided in the distal end section, said ultrasonic probe having an ultrasonic wave radiating and receiving surface which is projected from the surface of the distal end section and an ultrasonic wave conducting element formed of a soft, porous, water absorbing elastic body which is bonded to the surface of

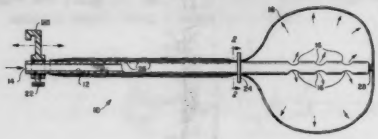
said ultrasonic probe, and said ultrasonic probe is provided in juxtaposition with the viewing window.

4,349,033

INTRAUTERINE CATHETER

Robert D. Eden, 4265 Marina City Dr., Apt. 909WTN, Marina Del Ray, Calif. 90291

Filed Nov. 6, 1980, Ser. No. 204,591
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **4 Claims**



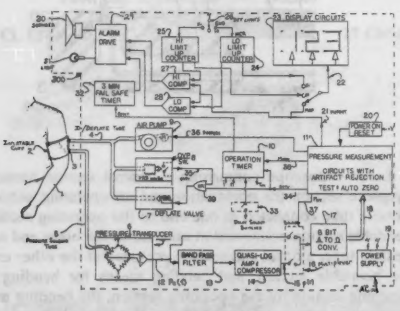
1. An intrauterine catheter for utilization with an exterior ultrasonic transducer comprising:
   (a) an elongated portion having at least one fill hole at a first end and at least one exit orifice at the second end, said elongated portion including a plurality of longitudinally spaced grooves;
   (b) a balloon substantially surrounding the entire length of said elongated portion including said second end and sealingly attached to said elongated portion adjacent said first end;
   (c) a cervical sound stop slidably positioned over said balloon and said elongated portion.

4,349,034

AUTOMATIC MEAN BLOOD PRESSURE READING DEVICE

Maynard Ramsey, III, Tampa, Fla., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 895,061, Apr. 10, 1978, which is a continuation-in-part of Ser. No. 670,902, Mar. 26, 1976, abandoned. This application Mar. 31, 1980, Ser. No. 136,129
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—681 **8 Claims**



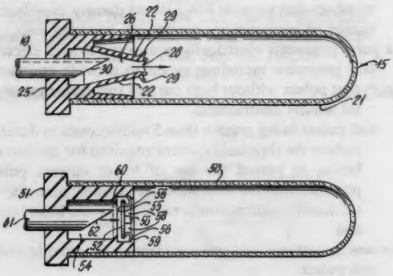
1. A method for automatically taking indirect mean blood pressure readings comprising the steps of:
   a. placing a cuff around a portion of a person's body;
   b. inflating the cuff to a predetermined pressure;
   c. taking a measurement of the peak to peak oscillation values of the cuff pressure with each heartbeat and a substantially simultaneous measurement of the cuff pressure;
   d. incrementally deflating the cuff at a predetermined increment of pressure, and maintaining said cuff pressure at a constant value for a predetermined period of time while taking a measurement of the peak-to-peak oscillation values of the cuff pressure with each heartbeat and a simultaneous measurement of the cuff pressure;
   e. continuously comparing the measurement of the peak to peak oscillation values at each cuff pressure to determine the maximum peak to peak value and storing said cuff pressure measurement obtaining when said maximum peak to peak value measurement was determined;
   f. repeating the steps (d) and (e) at least two more times after the maximum peak-to-peak value has been determined;
   g. determining and storing the lowest cuff pressure at which the maximum peak to peak value measurement is obtained;
   h. deflating the cuff if a measure of the peak-to-peak oscillation value is not obtained which is greater than or equal to the measurement value obtained at least two measurements before; and
   i. indicating the values of pressures obtained in said method steps.

4,349,035

BLOOD COLLECTION ASSEMBLY WITH UNIDIRECTIONAL FLOW VALVE

Joseph J. Thomas, Bridgewater; Vincent L. Vaillancourt, Livingston, both of N.J.; Marcus J. Millet, New York, N.Y., and William F. Smith, Branchburg, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 886,497, Mar. 14, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,466
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—766 **1 Claim**



1. A blood collection assembly for receiving a blood sample from a patient, but for preventing the blood from flowing out once it has been received comprising:
   a receptacle for the reception and retention of a sample of blood having a longitudinal axis;
   said receptacle having an inside pressure less than normal atmospheric pressure outside said receptacle thereby establishing a pressure gradient across said receptacle,
   said receptacle including an opening therein;
   a penetrable stopper sealably positioned in said opening to maintain said pressure gradient across said receptacle; and,
   a unidirecitonal flow-valve means disposed on said stopper inside said receptacle through which blood entering said receptacle must pass,
   said valve means spaced apart from the penetrable surface of said stopper and defining between said valve means and said penetrable surface, a chamber for receiving a tip of a sharp cannula instrument, and defining between said valve means and the interior of said receptacle a downstream portion;
   said valve means adapted to open for blood flow in response to the introduction of the tip of said cannula instrument into said chamber through said penetrable stopper, the pressure of said upstream portion being greater than said downstream portion following said penetration, and said

valve means adapted to close if the pressure of said downstream portion equals or exceeds the pressure of said upstream portion;

wherein said flow valve means includes an annular flange disposed on said stopper in said chamber defining a valve seat;

a resiliently operable valve member disposed in said chamber downstream of said valve seat, said valve member remaining sealably closed against said valve seat when the pressure in said receptacle equals or exceeds the pressure in said chamber, said valve member being resiliently flexible to move away from said valve seat when the pressure in said chamber is greater than the pressure in the remainder of said receptacle thereby allowing blood to flow into said receptacle;

wherein said valve member includes a substantially flat sealing surface substantially perpendicular to the longitudinal axis for contact with said valve seat and a plurality of spaced apart concave spring legs deformable toward the stream axis projecting substantially downstream from said sealing surface to serve as resilient supports for the same, the free ends of said legs being secured to said stopper so that the sealing surface engages said valve seat when said legs are under spring compression, whereby when the pressure in the space is greater than the pressure inside the receptacle said spring legs are urged under further compression to move said sealing surface away from said valve seat so that blood flows in the gaps between the spaced apart legs into the receptacle, and when the pressure inside the receptacle equals or exceeds the pressure inside the chamber, said legs are released from said further compression thereby urging said sealing surface back into contact with said valve seat to prevent blood from backflowing into said chamber.

4,349,036

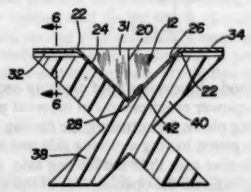
DISPOSABLE ASHTRAY

Francis K. Harvey, 413 Trippe Ave., Easton, Md. 21601; Larrabee Franks, 515 Druid Hill Ave., Salisbury, Md. 21801, and David L. Ingraham, E. Walnut St., Delmar, Del. 19940

Filed Oct. 21, 1980, Ser. No. 199,372

Int. Cl.³ A24F *19/02*

U.S. Cl. 131—240 R **7 Claims**



1. A disposable ash tray, comprising:

an elongated liner formed of a nonflammable material, said liner having a trough shaped portion for storing ash;

a base member having a trough shaped supporting surface for receiving the trough shaped portion of said liner,

said liner having a pair of substantially horizontal flanges extending outwardly from opposite sides of said trough shaped portion, respectively, at least part of each of said flanges being supported on said base member,

at least one cigarette receiving recessed portion formed on at least one of said flanges adjacent the trough shaped portion.

4,349,037

TOBACCO MOISTENING AND OPENING APPARATUS

Warren A. Brackmann, Cooksville, and Stanislav M. Snaidr, Mississauga, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

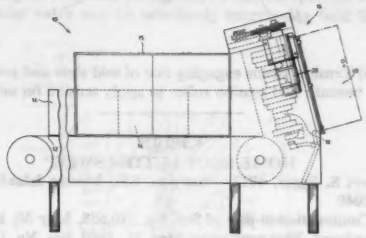
Division of Ser. No. 126,547, Mar. 3, 1980, Pat. No. 4,307,736.

This application Jun. 11, 1981, Ser. No. 272,515

Claims priority, application United Kingdom, Mar. 5, 1979, 7907714

Int. Cl.³ A24B *3/12*

U.S. Cl. 131—306 **1 Claim**



1. In a continuous method for the conditioning of tobacco in bales, which comprises continuously feeding a succession of tobacco bales horizontally with the grain in each bale oriented substantially vertically and with the grain extending from a forward face to a rear face of the bale, continuously subjecting the forward face of the succession of bales of the impingement of a plurality of steam jets to cause penetration of steam into the forward face and moistening of tobacco therein, and continuously removing the moistened tobacco from said forward face by the application of tobacco removal forces generally transverse to the leading face and generally perpendicular to the bale grain substantially simultaneously with said steam jet impingement, said steam penetration into said forward face exceeding the depth of tobacco removed therefrom by said transverse forces, the improvement wherein said plurality of steam jets are arranged in groups of two generally-helically directed sets with reference to and on opposite sides of a vertical axis, the vertical axes of the groups being parallel to each other and spaced from each other across the forward face of the bale, the steam jets in each helical set are arranged in individual pluralities, the members of each individual plurality extending perpendicularly from a second vertical axis parallel to the first-mentioned vertical axis but out of vertical alignment with the second vertical axis of the adjacent individual pluralities.

4,349,038

HAIR TREATMENT DEVICE

Joe Morefield, 400 Reynolds St., Springhill, La. 71075

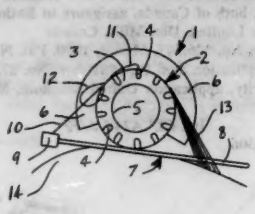
Filed Mar. 23, 1981, Ser. No. 246,603

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **10 Claims**

1. A hair treatment device for treating hair rolled thereon, comprising

(a) A tension roller having a plurality of longitudinally-shaped slots in the outer surface thereof; and



(b) Tension means engaging one of said slots and positioned beneath said tension roller to apply tension on said hair.

4,349,039

HOME ROOF GUTTER SWEEP

Robert S. Egger, 4012 - 91st Ave. SE., Mercer Island, Wash. 98040

Continuation-in-part of Ser. No. 910,658, May 30, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,250

Int. Cl.³ B08B *3/02, 9/00*

U.S. Cl. 134—167 C **15 Claims**

1. A rain gutter cleaning mechanism comprising a frame member movable along a rain gutter; a fixed tubular part of a rotary valve mechanism by said frame member; nozzle means carried by said valve part for directing fluid under pressure into a rain gutter; a rotary valve part of said rotary valve mechanism operatively disposed in said fixed tubular part; and a conduit connected to a source of fluid under pressure connected with said rotary valve part for delivering fluid under pressure to said rotary valve mechanism, selectively through said valve mechanism, out said nozzle means, and into the rain gutter.

4,349,040

FOLDING POOL CANOPY

Richard L. Miller, 3612 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 25, 1980, Ser. No. 181,117

Int. Cl.³ E04F *10/10*

U.S. Cl. 135—5 R **4 Claims**

1. A folding pool canopy apparatus, in combination, comprising:

a central support means including a pair of center plates rotatably connected and a pair of center plate locking means each rotatably connected to one of said center plates,

a first pair of support struts connected to each of said center plates,

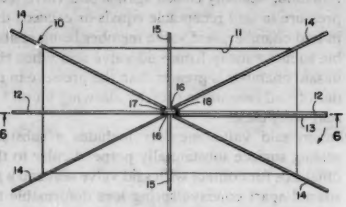
a second pair of support struts connected to each of said center plate locking means,

a plurality of support struts rotatably connected to said pair of center plates,

a flexible covering connected to said support struts, and

means for supporting the ends of said support struts,

said apparatus being movable between mounted and folded positions, wherein in said mounted position said center plates are positioned face to face, said center plate locking means are positioned at opposite ends of said center plates, said center plate locking means being for removably locking said center plates in said face to face position, said first



and second pairs of support struts extend radially outwards from said central support means approximately perpendicular to one another, and said support struts radiate outwardly from said central support means; and

in said folded position said center plates are positioned in-line, said center plate locks are positioned at opposite ends of said in-line center plates, and said support struts are parallel to one another and perpendicular to said in-line center plates.

4,349,041

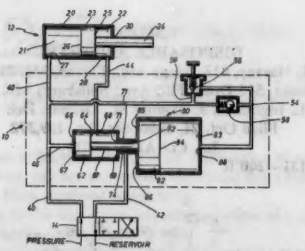
CONTROL VALVE SYSTEM FOR BLOWOUT PREVENTERS

H. John Bates, Santa Ana, Calif., assignor to NL Industries, Inc., New York, N.Y.

Filed Aug. 20, 1979, Ser. No. 67,609

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—1 **7 Claims**



1. In a method of reducing fluid capacity requirements and installed horsepower requirements of blowout preventers having an actuating piston for actuating the closing of the blowout preventer, the piston having a closing side and an opening side of smaller effective area than the closing side, the steps of:

(a) injecting fluid on the opening side of the actuating piston in order to move the actuating piston to an open position;

(b) selectively injecting fluid under pressure on the closing side of the actuating piston in order to initiate the movement of the actuating piston to close the blowout preventer;

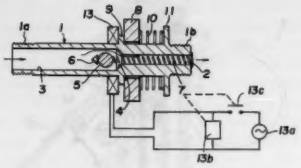
(c) selectively directing the fluid forced from the opening side of the actuating piston by the movement of the actuating piston in step (b) to the closing side of actuating piston until a predetermined pressure is obtained in the system; and

(d) after a predetermined pressure is developed in the system, redirecting the fluid forced from the opening side of the actuating piston to discharge to a reservoir.

4,349,042
FLUID SHUT-OFF DEVICE

Kunio Shimizu, 33-2, Asagaya-Minami 1-chome, Suginami-ku, Tokyo, Japan

Filed Jul. 28, 1980, Ser. No. 172,850
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—39 **6 Claims**



1. A fluid shut-off device for use in a gas supply pipe to, during an emergency such as an earthquake, shut off the supply of gas through the pipe, said device comprising:

a horizontally positioned elongated casing formed of a non-magnetic material, said casing having therein a passage adapted to be connected to a horizontal section of a gas supply pipe, a valve chamber in communication with said passage, and a valve seat between said valve chamber and said passage;

a valve body formed of a magnetic material and positioned within said valve chamber for substantially horizontal movement between a first position spaced from said valve seat, to allow substantially unrestricted flow of gas from said valve chamber to said passage, and a second position contacting said valve seat, to shut off the flow of gas from said valve chamber to said passage;

first spring means positioned in said passage for urging said valve body to said first position thereof, said first spring means having a sufficiently weak spring force to enable said valve body, upon the occurrence of an earthquake, to vibrate and move toward said second position thereof;

an annular permanent magnet member surrounding the exterior of said casing and slidable thereon;

a stop member on the exterior of said casing at a location such that when said magnet member is adjacent said stop member, said magnet member is located at a position surrounding said passage and adjacent to said valve seat;

second spring means positioned normally for urging said magnet member toward said stop member to said position adjacent said valve seat; and

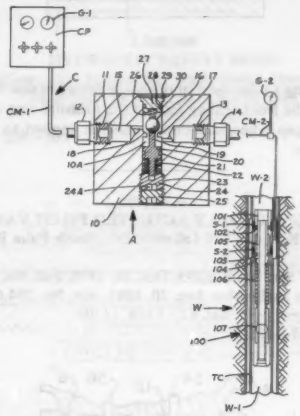
said magnet member having a magnetic strength insufficient to move said valve body, when in said first position thereof, against said spring force of said first spring means to said second position thereof, but sufficient to move said valve body against said spring force of said first spring means to said second position thereof upon movement of said valve body, due to an earthquake, a predetermined distance against said spring force of said first spring means from said first position thereof toward said second position thereof.

4,349,043
METHOD AND APPARATUS FOR PREVENTION OF OVER-PRESSURIZATION OF A PRESSURE RESPONSIVE DEVICE

Bruce D. Christensen, New Orleans, La., assignor to Baker CAC, Inc., Belle Chasse, La.

Filed Jun. 6, 1980, Ser. No. 156,980
Int. Cl.³ F16K *17/04*
U.S. Cl. 137—505.42 **1 Claim**

1. A subterranean well flow control device having a valve head selectively movable into sealing engagement on a valve seat for prevention of transmission of well fluids therethrough from at least one production zone within the well to the top of the well, said valve head being shiftable to one position by control fluid pressure in excess of a first predetermined value, said valve head and seat including elastomeric seal elements exposed to the control fluid pressure, a control line transmission conduit for said control fluid pressure extending from said well flow control device to the top surface of the well and thence to a source of fluid pressure, a pressure isolation device connected in series in said control line transmission conduit, said pressure isolation device comprising a housing, a fluid passageway through said housing, means on opposite ends of said fluid passageway for connecting said fluid passageway in series with said control line transmission conduit, an annular substantially friction free valve seat disposed in transverse relationship to said fluid passageway, a ball co-operable with said annular valve seat for selectively interrupting fluid flow



through said fluid passageway, resilient means urging said ball onto said annular valve seat, plunger means normally holding said ball off of said annular valve seat, piston means carried by said plunger means and responsive to fluid pressure in the inlet side of said fluid passageway for urging said plunger in a direction to permit said ball to move into engagement with said annular valve seat upon increase of pressure in said fluid passageway above a second predetermined value higher than said first predetermined value but not harmful to said elastomeric seal elements, and biasing means for shifting said ball away from said annular valve seat when fluid pressure within said fluid passageway does not exceed said second predetermined value, thereby preventing the application of excessive control fluid pressure to said subterranean well flow control device.

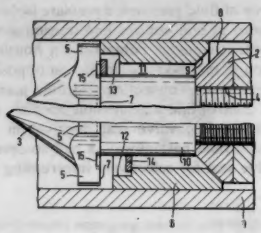
4,349,044
NON-RETURN DEVICE AT THE SCREWHEAD OF SCREW INJECTION MOLDING MACHINES

Karl Schirmer, Nuremberg, Fed. Rep. of Germany, assignor to Mannesmann Demag Kunststofftechnik Zweigniederlassung der Mannesmann Demag Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,804
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942317; Aug. 21, 1980, 3031502
Int. Cl.³ B29F *1/04*
U.S. Cl. 137—512.3 **10 Claims**

1. In a screw injection moulding machine having an injection cylinder and a screw rotatable and reciprocable within said cylinder and provided with a screwhead, a non-return device at the screwhead comprising a pressure ring freely displaceable between front and a rear abutments and which is slidably guided by its outer periphery on the interior surface of the injection cylinder and leaves a flow gap at its inner periphery for material to be fed therethrough by the screw, the pressure

ring further having a rear sealing face co-operating with said rear abutment, the improvement comprising a front sealing face on the pressure ring cooperating with said front abutment and an annular check valve substantially coaxial with the



pressure ring so disposed in the space between said front abutment and the front sealing face of the pressure ring as to close said flow gap when said check valve is applied to said front sealing face.

4,349,045

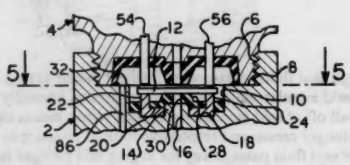
MAGNETICALLY ACTUATED PILOT VALVE

Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408

Division of Ser. No. 973,299, Dec. 26, 1978, Pat. No. 4,310,023. This application Aug. 20, 1981, Ser. No. 294,683

Int. Cl.³ F16K *31/08*

U.S. Cl. 137—625.5 **8 Claims**



1. A magnetically actuated pilot valve having a housing, said housing having an enclosed chamber, a first passage in said housing having a first opening to said chamber, an armature plate positioned in said chamber for movement between a first position against said first opening and a second position away from said first opening, said armature plate being permanently magnetized with a north pole at one location and a south pole at another location, pole piece means including two pole pieces extending into said chamber toward said armature plate, each pole piece having a free end extending toward said armature plate, at least one pole piece having its free end spaced from said armature plate when said armature plate is in its first position, means aligning said armature plate with said north pole location in line with one pole piece and said south pole location in line with said other pole piece, a second passage in said housing having a second opening to said chamber, means for magnetically energizing said pole pieces to move said armature plate away from its first position to its second position to open said first opening or to move said armature plate away from its second position to its first position to close said first opening, first and second metal members positioned on opposite sides of said first passage with their ends being on a plane substantially with said first opening, said metal members being aligned with said armature plate, when said armature plate is in its first position it is attracted to the two metal members for maintaining it in its first position and when said armature plate is in its second position it is attracted to the two pole pieces for maintaining it in its second position.

4,349,046

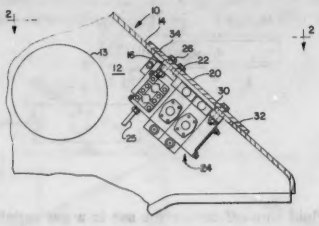
HYDRAULIC VALVE BLOCK MOUNTING

John E. Klem, Waukegan, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Sep. 15, 1980, Ser. No. 187,237

Int. Cl.³ F16L *3/00*

U.S. Cl. 137—899 **8 Claims**



1. In an articulated vehicle having a hydraulic system including a hydraulic valve bank with a plurality of hydraulic valves, the improvement comprising:

a front frame structure of said articulated vehicle defining an enclosure having a man access opening and having a top plate having an outer surface, said top plate having a valve bank access port, and a plurality of small apertures arranged at the periphery of said valve bank access port;

a valve bank mounting plate having a first surface and having a plurality of apertures positioned on said top plate to cover said valve bank access port;

a valve bank carried on said first surface of said valve bank mounting plate, said valve bank having overall outside dimensions restricted to the height and width dimensions of said valve bank access port, said valve bank being hydraulically connected within said front frame structure to said vehicle hydraulic system;

a plurality of fasteners passing through said plurality of apertures in said valve bank mounting plate and said plurality of small apertures of said top plate whereby said valve bank mounting plate and said valve bank are fixed to said outer surface of said top plate with said first surface of said valve bank mounting plate adjacent said outer surface of said top plate.

4,349,047

FLOW PLUG

Fred S. Ditto, deceased, late of Calgary, Canada, and by Teresa M. Ditto, executrix, 135 Whitewood Pl. NE., Calgary, Alberta, Canada T1Y 3S8

Filed Nov. 17, 1980, Ser. No. 207,557

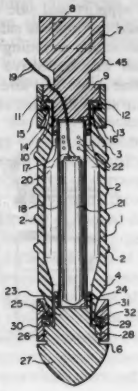
Claims priority, application Canada, Nov. 15, 1979, 339886

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—93 **5 Claims**

1. An expansible plug for a cylindrical passage comprising a flexible sleeve open at each end thereof, said sleeve being expansible under the influence of internal gas pressure; substantially rigid end caps closing the ends of said sleeve; pipe means extending between said end caps for maintaining the sleeve in elongated condition during insertion of the deflated plug into a passage; a compressed gas container in said pipe means; first electrically operated valve means normally closing said container; electrical leads extending from said valve means through one end cap for connection to a source of electrical power for opening said valve means; permitting the escape of

gas under pressure into said pipe means; and discharge openings in said pipe means permitting the flow of such gas under



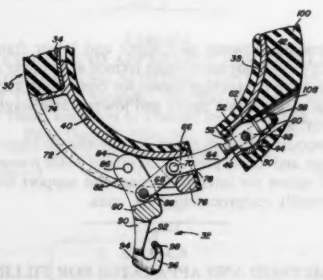
pressure into said sleeve to expand the plug, thereby sealing the passage.

4,349,048

PIPE THREAD PROTECTOR

Jim W. Clark, Houma, La., assignor to Superior Casing Crews, Inc., Metairie, La.

Filed Dec. 17, 1980, Ser. No. 217,415
Int. Cl.³ B65D *59/00*; F16L *57/00*
U.S. Cl. 138—96 T **8 Claims**



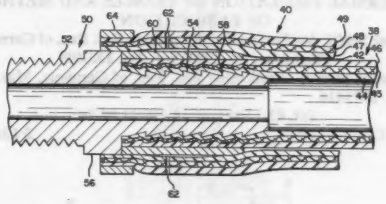
1. A thread protector comprising an annular member having an axial line of separation to enable it to be installed on the threaded end of a pipe or the like, said annular member comprising an internal tension belt constructed of resilient material and shaped to bias the ends of the protector away from each other to open the protector when the ends of the belt are disconnected, means moving the ends of the belt towards each other for clamping the protector onto the threads and permitting the ends of the belt to move away from each other, said belt including a resilient body encapsulating the belt with said means being exposed for access, said means including a handle structure pivotally supported from the belt, a yoke bolt bridging the juncture between the ends of the belt and being connected to the end of the belt opposite from the handle, a link interconnecting the bolt and handle whereby pivotal movement of the handle will cam the ends of the belt towards each other for clamping engagement and movement of the pivotal connection between the bolt, link and handle past to center of the pivotal connection between the handle and belt will retain the handle in said protector clamping position and enable the opening bias of the belt to open the thread protector after the handle is moved outwardly over the pivot center of the pivotal connection between the handle and belt, said yoke bolt including means adjustably connecting the bolt to the belt, and adjustable means including a swivel connection between the yoke bolt and belt, said bolt extending through the swivel connection with a threaded nut adjusting the bolt in relation to the wivel connection, said belt including a sheet of metallic material having a pair of plates connected to the remote ends thereof with the plates being arcuate and the sheet of material being preformed to a radius greater than the radius of the pipe for spring biasing the protector to open position, said handle and link being disposed in a radially extending open box defined by spaced parallel side walls and end walls with the handle and link being completely received therein when in said protector clamping position.

4,349,049

HYDRAULIC SAFETY HOSE

E. Ray Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Nov. 28, 1980, Ser. No. 211,313
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—103 **10 Claims**



1. A hydraulic safety hose comprising:
an inner primary fluid pressure hose for transmitting fluids under high pressure;
an outer secondary fluid pressure hose surrounding and substantially coextensive in length with said inner primary hose,
said outer and inner hoses being sized to provide an annular fluid passageway therebetween;
said secondary hose including a bleed orifice means which in the event of rupture of said inner primary hose enables pressurized fluid passing into and through said annular passageway to pass safely through said bleed orifice means outwardly of the secondary hose under low pressure.

4,349,050

BLAST JOINT FOR SUBTERRANEAN WELLS

Arthur E. Bergstrom, Montgomery; Richard H. Nelson, Houston, both of Tex., and George P. Maly, Fullerton, Calif., assignors to Carbide Blast Joints, Inc., Houston, Tex.

Filed Sep. 23, 1980, Ser. No. 190,089
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—147 **11 Claims**

1. In a blast joint for a tubing wherein a plurality of heat abrasive resistant wear rings, each having substantially planar end faces, are coaxially mounted in end face-to-face array on said tubing and are resiliently compressed thereon by axial spring means, the improvement comprising:
a pair of spaced annular clamping collars distally and coaxially carried on said tubing and retaining said wear rings and spring means therebetween, each of said collars including a collet joint formed by an internally threaded clamp ring having a tapered inside wall, an expandible clamping sleeve having a tapered outside wall received within said clamping ring and having a plurality of longitudinal slots extending from at least one end partially along the length thereof, and an externally threaded clamp

bushing having an inside shoulder bearing against the end of said expanding clamping sleeve and threaded into said

clamp ring to advance said expanding clamping sleeve in said ring and compress said expanding clamping sleeve against said tubing.

4,349,051

THERMAL INSULATION OF VESSELS AND METHOD OF FABRICATION

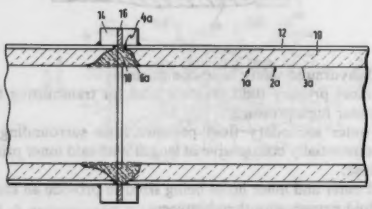
Lothar Schilf, Am Freibad 9, 2807 Achim, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,408

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911416

Int. Cl.³ F16L *9/18;* B65D *90/06*

U.S. Cl. 138—149 **3 Claims**



1. A thermally insulated high pressure vessel comprising,

a thick outer wall,

an inner wall radially spaced from and within the outer wall, said inner wall being thinner than said outer wall and defining a space between the inner wall and the outer wall,

a powder insulating material completely filling said space, and

a high vacuum within said space, said inner wall comprising a flexible wall irreversibly compressed toward said outer wall and deformed against said insulating material after the high vacuum is created in said space.

4,349,052

HEALD FRAME FOR LOOMS

Saichi Yaji, Izumisano; Kazuya Kitawaki, Osaka, and Takafumi Furuya, Izumisano, all of Japan, assignors to Nankai Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1980, Ser. No. 154,756

Claims priority, application Japan, Aug. 27, 1979, 54-117627; Feb. 6, 1980, 55-14337; Apr. 4, 1980, 55-45666

Int. Cl.³ D03C *9/06*

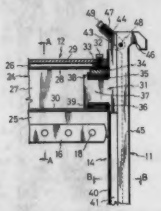
U.S. Cl. 139—92 **6 Claims**

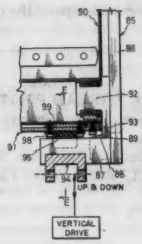
1. A heald frame for looms, comprising;

a heald frame structure comprising upper and lower frame staves and opposed lateral side stays connecting members interconnecting said upper and lower frame staves and said side stays, carrier rods attached to said upper and lower frame staves respectively, and a plurality of healds extending between said carrier rods,

a pair of support members separate from said heald frame structure which support said side stays respectively and which are disposed on opposite sides of said heald frame,

said heald frame structure including elastic members each disposed between the respective connecting members between said frame staves and said side stays, and one or more intermediate stays disposed at suitable positions and





extending between said upper and lower frame staves, each of said side stays being formed at its upper and lower ends with connecting means for connecting said intermediate stays to said upper and lower frame staves, respectively, and

said support members comprising means for supporting said upper and lower projections in said heald frame structure and means for interconnecting said support members to vertically reciprocating drive units.

4,349,053

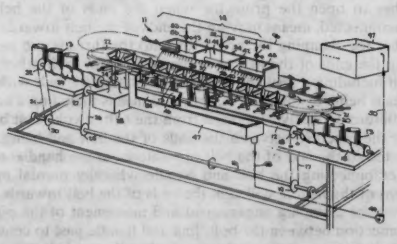
METHOD AND APPARATUS FOR FILLING CONTAINERS WITH LIQUID

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Filed Mar. 5, 1980, Ser. No. 127,530

Int. Cl.³ B65B *3/06, 43/54*

U.S. Cl. 141—1 **12 Claims**



1. A method for filling open top containers with a liquid material, the method including advancing a line of tilted open

top containers along a predetermined substantially straight path through a filling region and discharging a liquid material in a substantially uniform continuous sheet of unsupported flowing liquid from an elongated substantially straight discharge edge extending through the filling region in the direction of said predetermined path at a level spaced above the open tops of the containers, the method being characterized by

dividing said substantially continuous sheet of unsupported flowing liquid in the space between the discharge edge and the open tops of the containers into a plurality of separate equally spaced downwardly converging streams aligned with the open tops of corresponding containers in the line of containers advancing through the filling region by providing a plurality of spaced deflectors, disposed in a line under the elongated discharge edge and above the open tops of the containers, each of the deflectors having surfaces facing opposite one another, diverging downwardly, and intersecting the sheet of liquid with the highest point of each deflector being aligned approximately with the region between respective adjacent containers in the line of containers, each downwardly converging stream engaging oppositely disposed diverging surfaces of adjacent deflectors,

moving said divided streams continuously in the direction of the predetermined path in synchronism with the advance of the corresponding containers through the filling region by moving said deflectors along said predetermined path in synchronism with the advance of the containers through the filling region, thereby preventing the liquid material from contacting the outside surfaces of the containers during the filling thereof, and

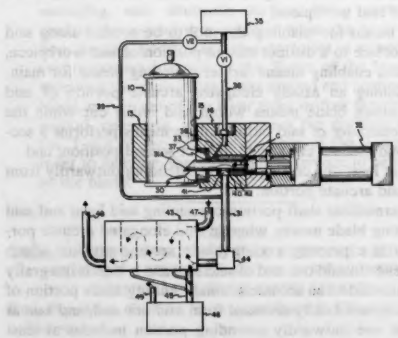
adjusting the discharging of liquid material in the sheet in relation to the rate of advance of the containers and the length of the discharge edge to assure overfilling of each tilted container.

4,349,054

METHOD AND APPARATUS FOR SAFELY DESTROYING AEROSOL CONTAINERS

Donald M. Chipman, Memphis, and Ray D. Bales, Millington, both of Tenn., assignors to Plough, Inc., Memphis, Tenn.

Filed Dec. 15, 1980, Ser. No. 216,094
Int. Cl.³ B65B *3/04*; B67B *7/24*
U.S. Cl. 141—1 **19 Claims**



8. Apparatus for safely destroying an aerosol container containing flammable propellent comprising:

a. means for restraining movement of said aerosol container,

b. puncturing means adapted to penetrate said aerosol container at a point of puncture while the movement of said aerosol container relative to said restraining means is restrained,

c. means for providing inert media that will prevent ignition of the aerosol containers flammable propellant to said point of puncture during penetration, and

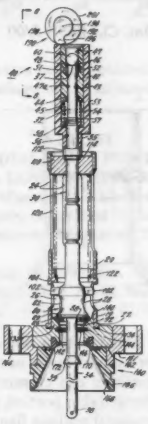
(d) wherein the element c inert media means comprises an inert media holder adapted to hold inert media around said point of puncture during penetration.

4,349,055

FILLING VALVE FOR BEVERAGE CONTAINER FILLING MACHINE

Anthony J. DiChiara, 10 St. Paul's Crescent, Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 972,282, Dec. 22, 1978, abandoned. This application Jan. 13, 1981, Ser. No. 224,744
Int. Cl.³ B65B *31/00*
U.S. Cl. 141—39 **58 Claims**



1. A filling valve for filling a container with liquid from a pressurized bowl, said valve comprising:

a housing;

a filling orifice through said housing, through which liquid can be fed;

a valve seat in said housing and around said filling orifice;

a liquid flow valve element in said housing and shiftable onto and off said valve seat for selectively closing and opening said filling orifice, respectively;

a gas flow conduit comprising:

a gas flow tube extending from above said liquid flow valve element, through said liquid flow valve element and extending below said liquid flow valve element to be below said valve seat;

a first gas flow opening in said gas flow tube above said valve seat; a second gas flow opening in said gas flow tube below said valve seat; said gas flow tube joining said first and said second gas flow openings;

said gas flow conduit being shiftable axially together with said liquid flow valve element, with respect to said housing;

a cover for closing said first gas flow opening;

said cover comprising:

a closure element shaped for blocking said first gas flow opening and being movable between a first position away from said first gas flow opening and a second position at and blocking said first gas flow opening;

a support for said closure element; first biasing means connecting said closure element support and said closure element for normally biasing said closure element against moving to its said second position; said first biasing means has the characteristic that upon a predetermined gas pressure differential developing between the interior of said bowl at said first gas flow opening, on the one hand, and at said second gas flow opening, on the other hand, said closure element is urged to

its said second position by the gas flow through said first gas flow opening to said second gas flow opening, and the bias of said first biasing means is overcome;

second biasing means connecting said closure element support and said gas flow tube for biasing said support in a direction to normally move said closure element away from its said second position.

4,349,056

CONTAINER FOR LIQUID WITH NON-DRIP MEASURING CAP CLOSURE

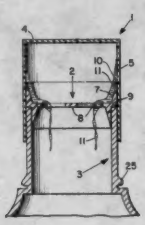
Jorgen Heino, Bruxelles, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1980, Ser. No. 219,419

Claims priority, application United Kingdom, Dec. 29, 1979, 7944581

Int. Cl.³ B65B 3/00

U.S. Cl. 141—381 1 Claim



1. A container for liquid with a non-drip measuring cap closure, said container comprising a neck integral with the container body, a measuring cap closure with a closed end portion and a non-perforated skirt portion, an insert received in said neck having a peripheral resilient flange in the form of an end lip so dimensioned as to scrape residual liquid from the inner wall of the skirt portion as the cap is applied to the container after it has been used for measuring so that residual liquid is caused to run back into the container and does not drip down the outside of the container, said insert including downwardly protruding means to engage the container neck and cross-bar means to assist in dispensing liquid and between which scraped residual liquid flows back into the container.

4,349,057

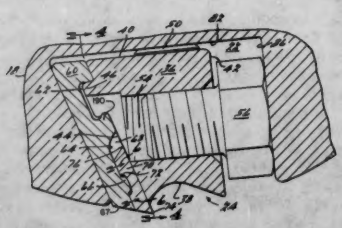
CUTTING BLADE ASSEMBLY FOR A POWER PLANER

Rainer Bachmann, Hohenstein, and Helmut Ulm, Limburg, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 18, 1980, Ser. No. 160,584

Int. Cl.³ B27G 13/00

U.S. Cl. 144—230 9 Claims



1. In a power planer having a motor drivingly coupled to a rotary cutter head for supporting at least one cutting blade assembly comprising an elongated pressure piece, and elongated carrier piece engaged with said pressure piece, and a blade; the improvement wherein:

said pressure piece and said carrier piece have substantially complementary contoured mating surfaces formed thereon which permit said pieces to be jointed only by longitudinally inserting one into the other in the direction of elongation thereof, said pieces when joined being frictionally engaged and rigidly held together by said complementary contoured mating surfaces, and said pieces defining therebetween an elongated slot in which said blade is received and retained.

4,349,058

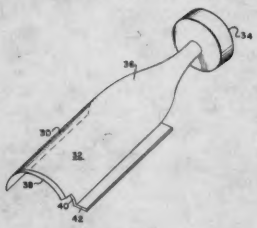
CUTTING TOOL AND A METHOD OF USING SAME

John E. Comparetto, 108 Cropper St., Chincoteague, Va. 23336

Continuation-in-part of Ser. No. 763,632, Jan. 28, 1977, Pat. No. 4,150,675. This application Apr. 23, 1979, Ser. No. 32,309

Int. Cl.³ A61B 17/16

U.S. Cl. 145—24 14 Claims



1. An elongated cutting tool capable of severing sections from a workpiece of wood, plastic, bone or similar material, said tool comprising:

a head portion at one end of said tool;

cutting blade means at the opposed end of said tool said cutting blade means including:

(a) means for forming an initial distinct cut in one surface of said workpiece;

(b) means for enabling the tool to be rotated along said surface to a distinct second position of said workpiece, said enabling means further including means for maintaining an axially elongated arcuate portion of said cutting blade means within said initial cut while the remainder of said cutting blade means performs a second distinct cut at said distinct second position; and

(c) at least one cutting portion extending outwardly from said arcuate portion; and

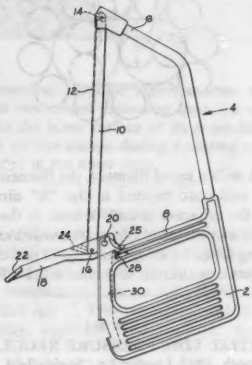
an intermediate shaft portion connecting said head and said cutting blade means, wherein said elongated arcuate portion is a primary cutting blade arcuate portion which extends to said one end of said tool and which is integrally connected to an arcuate auxiliary cutting blade portion of similar arc axially recessed from said one end, and said at least one outwardly extending portion includes at least one third cutting blade portion integrally connected with said auxiliary portion, said third portion extending outwardly directly from said auxiliary portion and being axially recessed from said one end whereby, when said tool is partially withdrawn, turned and moved from said first distinct position to said second distinct position and is reinserted into the workpiece to form said second of said two distinct cuts, a desired wedge-shaped section will be severed from said workpiece.

4,349,059

BLADE HOLDERS

Paul S. Hepworth, and Martin G. Whitehouse, both of Leicester, England, assignors to Plas Plugs Limited, Derby, England

Filed May 15, 1981, Ser. No. 264,412
Claims priority, application United Kingdom, May 27, 1980, 8017329
Int. Cl.³ B27B *21/02*
U.S. Cl. 145—33 A 3 Claims



1. A blade-holder having a C-shaped portion with two ends parts, and adapted for use with a strip blade having an opposed pair of mounting projections provided at each of first and second end portions thereof and being arranged to span said C-shaped portion, said C-shaped portion comprises:

a first arm member with a T-slot provided therein to receive the opposed projections of the first end portion of the blade,

a second arm member with a pivot mounting thereon, and

a pivotal lever having an end portion mounted on said pivot mounting, a T-slot being provided on said lever so as to be inwardly spaced from its mounting and being adapted to receive the opposed projections of the second end portion of the blade when the lever is in a first, loading position, said lever further including an abutment surface projecting outwardly from its end portion adjacent said pivotal mounting, said abutment surface being arranged to contact the second arm member when the lever is in its first, loading, position and thereby to act as an end stop to ensure correct location of the T-slot of the lever when receiving the projections of the second end portions of the blade, movement of the lever from its first position into a second, operating, position causes the distance between the T-slot of the first arm member of the T-slot of the lever to increase, thereby enabling tension to be imparted to the blade.

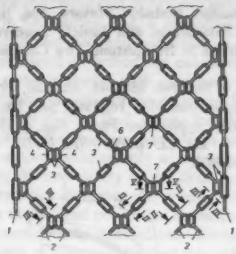
4,349,060

MEANS FOR IMPROVING THE SURFACE GRIP OF A TIRE OF A VEHICLE AND A METHOD FOR MANUFACTURING SUCH MEANS

Kare Espedalen, Stavern, Norway, assignor to Elkem A/S, Oslo, Norway

Filed Mar. 9, 1981, Ser. No. 241,595
Claims priority, application Norway, Mar. 19, 1980, 800788
Int. Cl.³ B60C *27/00*
U.S. Cl. 152—172 7 Claims

1. An anti-skid device intended to be fitted on vehicle wheels for improving the traction of the wheel on the ground, comprising at least two chains which are intended to surround the tread face of the wheel and being arranged in an approximately zig-zag shaped formation along the circumference of the wheel, the at least two chains being interconnected and connected to support means intended to extend along the inner and outer walls of the tire for supporting the zig-zag shaped formation, the interconnection being provided by welding a certain number of neighbouring links of adjacent chains together.

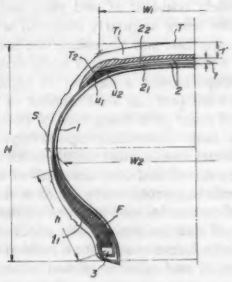


4,349,061

PNEUMATIC RADIAL TIRES FOR PASSENGER CARS HAVING A LOW ROLLING RESISTANCE

Hiroshi Hirakawa, Musashino; Akio Sato, Higashimurayama; Takashi Takusagawa, Ohme, and Nobumasa Ikeda, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 18, 1980, Ser. No. 179,197
Claims priority, application Japan, Sep. 1, 1979, 54/111038
Int. Cl.³ B60C *13/00, 15/06, 1/00*
U.S. Cl. 152—209 R 10 Claims



1. A pneumatic radial tire for passenger cars having a low rolling resistance, comprising; a toroidal carcass composed of one ply of radially arranged polyester cords, each end portion of said ply being turned around a bead core to form a turnup portion; a belt superimposed about said carcass and comprising plural rubberized plies each containing cords arranged at an inclination angle of 60°–80° with respect to a radial plane of the tire, the cords of said plies being crossed with each other; a bead filler rubber having a dynamic modulus of 700 kg/cm^2–1500 kg/cm^2 and a Shore A hardness 80°–95° arranged between said carcass and said turnup portion at a region extending from said beaad core to a substantially middle part of a side portion; a tread rubber composed of major parts of styrene-butadiene copolymer rubber and minor parts of polybutadiene rubber and containing a predetermined amount of carbon black ISAF and a base rubber composed of major parts of natural rubber and minor parts of polybutadiene rubber and containing a predetermined amount of carbon black HAF and having a loss modulus of 2 kg/cm^2–12 kg/cm^2 and a resilience of 60%–85%; said base rubber arranged between said belt and said tread rubber on a volume ratio in said tread rubber of 0.1–0.5 so that said base rubber wraps said belt from one end to the other end over an upper portion thereof.

4,349,062

HIGHLY DURABLE PNEUMATIC TIRE COMPRISING BIAS LAID CARCASS CONSTRUCTION FORMED OF SUPERIMPOSED STACKED PLIES

Yasuaki Tsurunaga, Kodaira; Masaru Abe, Sayama; Hideaki Hashimoto, Musashino, and Junichi Tsuzura, Urawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 938,145, Aug. 30, 1978, abandoned.
This application May 16, 1980, Ser. No. 150,498
Claims priority, application Japan, Sep. 6, 1977, 52-106285
Int. Cl.³ B60C *9/06, 15/00*
U.S. Cl. 152—356 R **6 Claims**

1. A pneumatic tire comprising a bias laid construction carcass body having a plurality of superimposed stacked plies, each of said plies including rubberized textile cords, the cords of approximately one-half of said plies and the cords of the remaining plies being angularly disposed with respect to the peripheral center line and oppositely inclined with respect to each other, wherein said carcass body comprises outer and inner ply groups having a number of outer and inner plies, respectively, such that the total number of plies is at least 8, said outer and inner plies comprised of outer and inner cords made of the same materials, respectively, said outer cords having a diameter smaller than the diameter of said inner cords such that the ratio of said cord diameter of said inner cords to said outer cords is approximately 1:0.89 to 0.62, said cords in a region of said carcass located between a sidewall portion and a bead portion of said tire periodically experiencing both tensile and compressive forces as said tire is rotated in a loaded condition, the ratio of said number of said outer plies to the total number of inner and outer plies, excluding turned-up portions, at a region intermediate the maximum width portion of said tire and the bead portion thereof, is approximately from 0.13 to 0.67, said bead portion having at least two bead cores and one of the plies of one of the inner and outer ply groups at a boundary surface between the inner and outer ply groups is wound around a first bead core having at least one ply of the other of said inner and outer ply groups wound therearound and the remaining plies of said one of the inner and outer ply groups are wound around a second bead core, wherein all of the plies of one of the inner and outer ply groups are not wound around the first bead core.

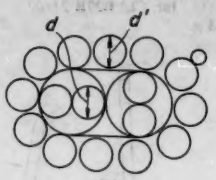
4,349,063

PNEUMATIC RADIAL TIRES

Michitsugu Kikuchi, Mitaka, and Yoshio Suzuki, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,776
Claims priority, application Japan, Dec. 18, 1979, 54/163452
Int. Cl.³ B60C *9/00*
U.S. Cl. 152—359 **6 Claims**

1. In a pneumatic radial tire containing steel cords as a reinforcement for at least one of the carcass and belt thereof, the improvement comprising; said steel cords having such a flat section inclusive of an elliptic section that two to three strands, each strand being produced by twisting plural filaments of 0.1–0.4 mm diameter, are arranged in parallel with each other to form a core and plural filaments are twisted around said core



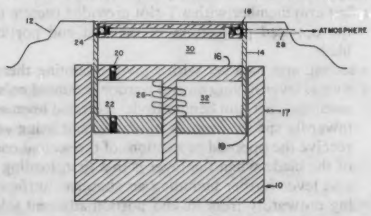
and wrapped with a spiral filament, the filaments in one strand constituting said core twisted in the "S" direction and the filaments in the adjacent strand twisted in the "Z" direction and, a ratio of a diameter of filaments twisted around said core corresponding to the bending direction of said core to a diameter of filaments constituting said core is 0.3–2.0.

4,349,064

INERTIAL TIRE PRESSURE REGULATORS

George R. Booth, 6815 Landor La., Springfield, Va. 22152

Continuation of Ser. No. 961,448, Nov. 17, 1978, abandoned.
This application May 1, 1980, Ser. No. 145,562
Int. Cl.³ B60C *23/10*
U.S. Cl. 152—418 **7 Claims**



1. A pump for use within a pneumatic tire mounted on a rim to keep said tire from getting dangerously soft due to a slow leak, comprising: a cylinder attached to said rim; a piston within said cylinder, the axes of said cylinder and said piston being disposed radially outward from said rim; a first passage to allow unpressurized outside air to enter said pump; and a second passage to allow pressurized air to enter said pneumatic tire from said pump, said pump being operated by centrifugal force which causes said piston to move radially outward and spring means which forces said piston to move radially inward.

4,349,065

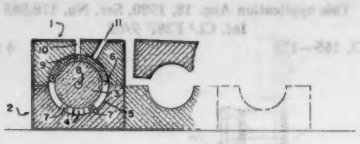
MOLD PRODUCING GLOBE-SHAPED BELLS WITH SINGLE-PIECE SHELLS

William R. Schall, Star Rte., Box 137, Apollo, Pa. 15618

Filed Sep. 15, 1980, Ser. No. 187,395
Int. Cl.³ B22C *9/10, 9/22*
U.S. Cl. 164—368 **6 Claims**

1. A bell mold comprising an upper block filled with a sand-based commercial molding composition, into which a dome-like depression has been made; a lower block filled with a sand-based commercial molding composition, into which a dome-like depression has been made; an inner core; formed of a sand-based molding composition, which is smaller than the globe-like cavity formed when the upper and lower blocks are

joined; at least two feet extending from the surface of the dome-like depression in the lower block to the inner core which they lift and hold in place; a tunnel, extending from the outer surface of the upper block to the inner surface of its



dome-like depression, through which molten metal can be poured; at least one tunnel extending from the upper block's outer surface to the inner surface of its dome-like depression through which air can escape during a casting process; and a jinglet, embedded in the inner core.

4,349,066

METHOD AND APPARATUS FOR CONTINUOUS CASTING OF A NUMBER OF STRANDS

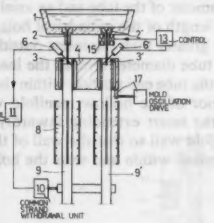
Markus Schmid, Zürich, and Hans Gloor, Umiken, both of Switzerland, assignors to Concast AG, Zürich, Switzerland

Filed Apr. 7, 1980, Ser. No. 138,178

Claims priority, application Switzerland, Apr. 27, 1979, 3975/79

Int. Cl.³ B22D *11/16*

U.S. Cl. 164—453 **14 Claims**



1. In a method for the continuous casting of a number of strands, wherein steel from at least one tundish is cast into continuous casting molds, the thus formed strands are withdrawn from the continuous casting molds at the same speed, cooled and the levels of molten steel in the continuous casting molds are maintained at desired heights, the improvement which comprises the steps of:

controlling the withdrawal speed in a first of said continuous casting molds as a function of the level of molten steel in said first continuous casting mold;

measuring the level of molten steel in each of the other molds; and

regulating the quantity of infed steel flowing into each of said other molds as a function of the level of molten steel in each respective other mold.

4,349,067

MACHINE AND METHOD FOR CONTINUOUSLY CASTING BATTERY GRIDS

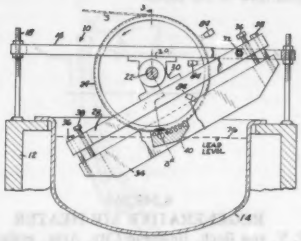
John W. Wirtz, and Raymond L. Schenk, both of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Continuation-in-part of Ser. No. 65,365, Aug. 9, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,479

Int. Cl.³ B22D *11/10*

U.S. Cl. 164—479 **34 Claims**

1. A machine for continuously casting battery grids comprising a rotary drum having a cylindrical outer surface, said outer surface having a cavity therein conforming to the desired battery grid pattern, a fixedly supported shoe having an arcuate surface thereon extending around an arcuate segment of the outer cylindrical surface of the drum in close fitting, sliding relation, said shoe overlying said cavity and having an inlet and an outlet therein for molten lead, a passageway in said shoe extending between said inlet and said outlet, a portion of said passageway comprising an orifice slot extending to said arcuate surface and communicating with a circumferential segment of the outer peripheral surface of the drum in which said cavity is formed, a pot for molten lead, means for directing molten lead under superatmospheric pressure from said lead pot to said inlet in an amount substantially in excess of that required to progressively fill said cavity as the drum rotates past said orifice slot, means for directing the excess molten lead from said outlet back to said lead pot so that a substantial quantity of molten lead is continuously recirculated between said lead pot and the orifice slot to maintain the lead throughout the orifice



slot at a relatively high casting temperature and flow restricting means for preventing free flow of molten lead from said orifice slot back to said lead pot to thereby maintain the molten lead in said orifice slot at said superatmospheric pressure.

16. The method of continuously casting battery grids around a rotating cylindrical drum having a battery grid cavity formed in the outer peripheral surface thereof by directing molten lead from a lead pot to successive segments of the peripheral surface of the rotating drum through an orifice slot in a fixed shoe having a curved surface conforming to and positioned against the periphery of the drum in close sliding engagement which includes the steps of continuously directing molten lead to said orifice slot in an amount substantially in excess of that required to fill the portion of the cavity rotating past the orifice slot, causing the excess molten lead to flow back to the lead pot and maintaining the molten lead in the orifice slot and said cavity at a pressure substantially above atmospheric.

4,349,068

METHOD FOR IMPROVED HEAT TRANSFER

Glenn E. Coury, 6600 W. 13th Ave., Ste. 2, Lakewood, Colo. 80214

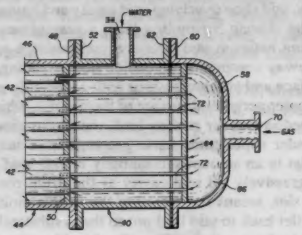
Filed Oct. 9, 1979, Ser. No. 82,561

Int. Cl.³ F28D *13/00, 15/00*

U.S. Cl. 165—1 **7 Claims**

1. The method of improved heat transfer as practiced in a heat exchanger module of the type having a tube side including a plurality of tubes and a shell side defining a volume surrounding said plurality of tubes, wherein a liquid is circulated on the tube side of the heat exchanger module for heat transfer through the tube walls, the improvement comprising: introducing into each of said plurality of tubes on the tube side of the heat exchanger module a substantially equal quantity of non-condensable gas for simultaneous flow in the same direction of flow through the tubes as the liquid, the gas being under sufficient pressure and in sufficient quantity to create, in combination with the liquid, a two phase flow regime throughout substantially the full length of the tubes on the tube side of the heat exchanger module to achieve a relative increase in heat transfer coefficient and overall velocity and turbulence within

the tubes to permit overall shorter tube length or reduced heat exchanger surface area, with respect to tube length or heat



exchanger surface area of a heat exchanger employing one-phase liquid flow in the tubes.

4,349,069

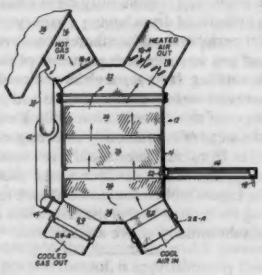
REGENERATIVE AIR HEATER

Harold F. V. von Beck, Bullhead City, Ariz., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 22, 1981, Ser. No. 266,245

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—4 **5 Claims**



1. Regenerative heat exchange apparatus including a housing, an inlet duct for a heating fluid and an outlet duct for heated air connected to one end of the housing to define a hot end of the heat exchanger, an outlet duct for cooled fluid and an inlet duct for cool air connected to the remote end of the heat exchanger to define a cold end therefor, a mass of heat absorbent material in said housing spaced from the ends thereof to define a hot end plenum chamber adjacent the inlet for the heating fluid and cold end plenum chamber adjacent the inlet for cool air, a source of heating fluid, a passageway connecting the source of heating fluid to the inlet duct for heating fluid, valve means in the inlet and outlet ducts for the heating fluid and air adapted to control the flow of fluid therethrough, a bypass duct connecting said passageway to the cold end plenum chamber, valve means in the bypass duct controlling the flow of heating fluid therethrough, and a blower in said bypass duct having an inlet connected to the source of heating fluid and an outlet exhausting heating fluid into the cold end plenum chamber at a pressure that exceeds the pressure of the air in said housing.

4,349,070

TUBE MAT HEAT EXCHANGER

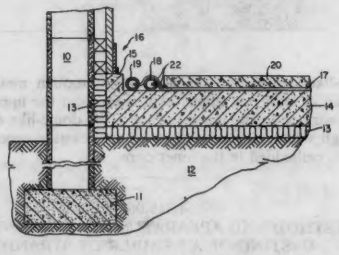
Michael F. Zinn; Steven E. Krulick, and Ronald W. Leonard, all of P.O. Box 87, 221 Canal St., Ellenville, N.Y. 12428

Division of Ser. No. 17,728, Mar. 5, 1979, Pat. No. 4,270,596.

This application Aug. 18, 1980, Ser. No. 178,885

Int. Cl.³ F28F *9/02*

U.S. Cl. 165—173 **4 Claims**



3. A method of connecting a tube of elastomeric material having a certain inside and outside diameter with the interior of a manifold through a cylindrical hole in the wall thereof comprising:

(a) pre-fitting within an end portion of the tube a cylindrical insert having an outside diameter at least as great as the inside diameter of the tube and an axial length greater than the axial length of the cylindrical hole, said hole having a diameter greater than the insert outside diameter and less than the tube diameter around the insert; and

(b) forcing the tube end portion within the hole entirely from the exterior of the hollow manifold with the respective ends of the insert extending inwardly and outwardly of the manifold wall so that the wall of the tube end portion is compressed within and seals the hole.

4,349,071

CEMENT RETAINER AND SETTING TOOL ASSEMBLY

David W. Fish, Carrollton, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

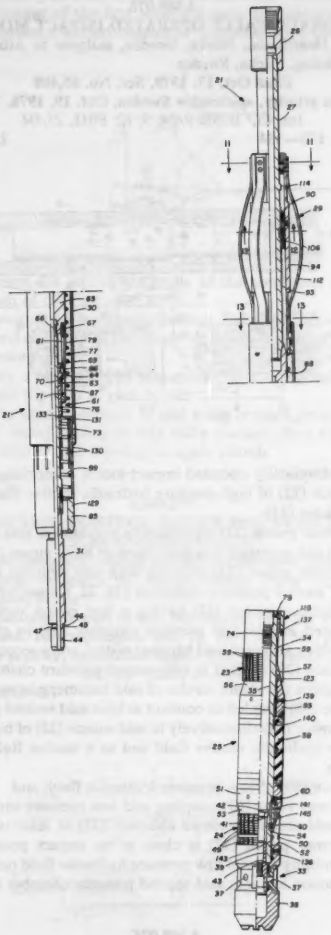
Filed Nov. 7, 1980, Ser. No. 204,750

Int. Cl.³ E21B *23/06, 33/129, 34/12*

U.S. Cl. 166—124 **49 Claims**

1. In a well tool assembly comprising a drillable cement retainer having upper and lower slip sets with a packing element therebetween and a cement valve connected to a mandrel, a setting tool with a tubular member having a valve actuator with one end connected thereto and the other end connected to said valve, a retaining sleeve supported on said tubular member and telescoped over a portion of said upper slip set to hold said latter set against being deployed, means for sliding said sleeve into a release position for said upper set to deploy, and a connection between said retainer mandrel and said tubular member of said setting tool for transmitting lifting force for setting said slip sets and for shifting said actuator to open and close said valve, wherein the improvement comprises said connection having a tubular connector with a lower end threadably coupled with said retainer mandrel to be rotated loose from said mandrel subsequent to setting said slip sets and pressure testing said packing element for leakage, an upper end slidably and non-rotatably connected to said tubular member for limited sliding movement relative thereto in an axial direction, and a releasable locking mechanism normally securing

said upper end of said connector to said tubular member against said limited sliding movement and movable only after deployment of said upper slip set to release said upper end for such movement.



4,349,072

METHOD AND APPARATUS FOR CONDUCTING LOGGING OR PERFORATING OPERATIONS IN A BOREHOLE

Pierre C. Escaron, Houston, and Joachim A. Hoppe, Spring, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 6, 1980, Ser. No. 194,016
Int. Cl.³ E21B *23/08, 43/11, 47/00*
U.S. Cl. 166—250 34 Claims

1. A method for logging earth formations surrounding a borehole, utilizing a well-logging tool releasably mounted to the end of a length of drill pipe, comprising:

lowering the length of drill pipe, having the well-logging tool releasably mounted thereon, into the borehole;

lowering an extension member through said drill pipe into engagement with said well-logging tool;

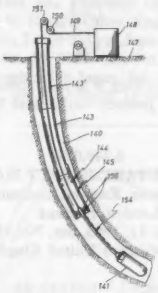
securing said extension member to said well-logging tool;

releasing said well-logging tool, with said extension member secured thereto, from said drill pipe; and

moving said well-logging tool, with said extension member secured thereto, through the borehole and beyond the drill pipe to log at least a portion of the earth formations surrounding said borehole.

17. Apparatus for use in logging earth formations surrounding a borehole, comprising:

a latching sub having upper and lower ends and a central bore, including means for mounting said latching sub to



the end of a length of drill pipe, said means for mounting disposed at the upper end of said latching sub; and

a latching head, having upper and lower ends, releasably mounted within the bore of said latching sub, said latching head having:

means for attaching a well-logging tool to the lower end of said latching head;

a first electrical connection means disposed at the upper end of said latching head;

releasable latching means for engagement with said latching sub to releasably secure said latching head to said latching sub; and

means for selectively actuating said releasable latching means, said actuating means including a second electrical connection means, whereby the well-logging tool may be selectively released from the latching sub to enter the borehole.

4,349,073

HYDRAULIC JET WELL CLEANING

Casper W. Zublin, 801 Hewlett, Bakersfield, Calif. 93309, assignor to Casper M. Zublin, Bakersfield, Calif.

Filed Oct. 7, 1980, Ser. No. 195,303
Int. Cl.³ E21B *37/00, 37/06*
U.S. Cl. 166—312 3 Claims

1. A device for washing well liners comprising:

an elongate member having jet nozzles spaced along its length;

tubing connected to each end of said member;

a centralizer located proximate to one end of said member, said centralizer being rigid and having a central bore for slidably engaging said tubing to permit substantial axial movement along said tubing; and

means to confine said axial movement of said centralizer,

said axial movement being sufficient to permit reciprocation of said tubing with respect to said centralizer, said

reciprocation providing a jarring action to help free said centralizer when jammed within said liner.

4,349,074

CONVERTIBLE ROTARY IMPACT HAMMER DRILL

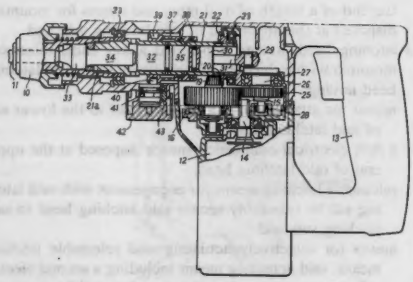
Norman J. Ince, Hampton, England, assignor to Kango Electric Hammers Limited, London, England

Filed Jun. 11, 1980, Ser. No. 158,382

Claims priority, application United Kingdom, Jun. 18, 1979, 7921151

Int. Cl.³ B25D *11/12*

U.S. Cl. 173—48 **3 Claims**



1. A rotary hammer drill comprising a rotary holder for a drill bit, a cylinder which is rotatably mounted in the casing of the drill and which is coaxial with and drivingly connected to the holder, a driver piston and a striker piston in the cylinder, a motor connected to said cylinder for driving said cylinder in rotation, a crank and connecting rod mechanism connected to said motor and said driver piston to reciprocate the driver piston in the cylinder, the striker piston being free for reciprocatory movement in the cylinder under the influence of the pressure of air trapped between the two pistons and being arranged to strike an anvil axially slidably disposed between the striker piston and the holder whereby hammer blows are transmitted to the holder, an aperture being formed in the cylinder wall at a location between the two pistons and beyond the position at which the aperture can be closed off by the driver piston, a sleeve mounted on the outside of the cylinder which sleeve is axially slidable between a first position in which the sleeve covers the aperture and prevents the passage of air into and from the cylinder through the aperture whereby both rotary and axial movement is imparted to the drill bit and a second position in which the aperture is uncovered and places the space between the pistons in communication with the ambient atmosphere whereby only rotary movement is imparted to said bit, and manually operable means for selectively moving the sleeve into said first and second positions.

4,349,075

HYDRAULICALLY OPERATED IMPACT MOTOR

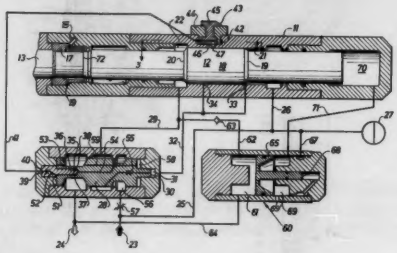
Stig R. Henriksson, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 17, 1979, Ser. No. 85,409

Claims priority, application Sweden, Oct. 19, 1978, 7810882

Int. Cl.³ B25D *9/04, 9/12*; F01L *25/04*

U.S. Cl. 173—134 **22 Claims**



1. Hydraulically operated impact motor comprising:
a source (23) of high-pressure hydraulic motive fluids;
a cylinder (11);
a hammer piston (12) reciprocably mounted in said cylinder (11) and arranged to impact upon an anvil means (13), said hammer piston (12) defining with said cylinder (11) first and second pressure chambers (21, 22, respectively);
said hammer piston (12) having a first piston surface (19) located in said first pressure chamber (21) to effect the working stroke of said hammer piston, and a second piston surface (20) located in said second pressure chamber (22) to effect the return stroke of said hammer piston;
a valve (28) coupled to connect at least said second pressure chamber (22) alternatively to said source (23) of high-pressure hydraulic motive fluid and to a motive fluid outlet (24);
a source (60) of low pressure hydraulic fluid; and
a one-way valve (63) coupling said low pressure source (60) to said second pressure chamber (22) at least when the hammer piston (12) is close to its impact position for permitting flow of low pressure hydraulic fluid only in the direction towards said second pressure chamber (22).

4,349,076

CHANGE-OVER SWITCH WITH DE-CHATTERING DEVICE FOR ELECTRONIC WEIGHING SCALES

Christian Oldendorf, Göttingen, and Franz-Josef Melcher, Hardegsen, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,810

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003900

Int. Cl.³ G01G *23/00*

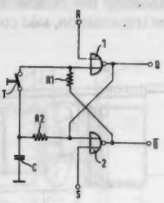
U.S. Cl. 177—164 **9 Claims**

1. A circuit for electronic weighing scales, for switching between two states under the control of mechanical contacts and at the same time obtaining de-chattering of said mechanical contacts, comprising:
a flip-flop constituted by a first and a second inverting gate with crossed feedback, wherein:
a first feedback circuit of said flip-flop comprises a first

resistor connected between the output of said second inverting gate and the input of said first inverting gate;

a second feedback circuit of said flip-flop comprises means for directly coupling the output of said first inverting gate to the input of said second inverting gate;

means for switching the state of said flip-flop comprising a condenser having one electrode connected to a source of constant potential, and a second electrode connected to the output of the first inverting gate by a circuit which comprises a second resistor of high resistance connected



between the second electrode of the condenser and the output of the first gate; and

a key switch, having a make contact, connected between the second electrode of the condenser and the input of the first inverting gate;

whereby each closing of said make contact causes the state of said flip-flop to switch; and

whereby contact-bounce of said make contact, immediately after initial closing of said make contact, does not cause the state of said flip-flop to again switch.

4,349,077

ELECTRIC CONTROL DEVICE FOR VEHICLE SUSPENSION SYSTEM

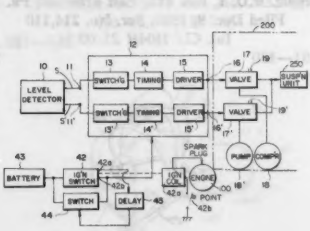
Tomoyoshi Sekiguchi, Atsugi, and Hiroya Ishikawa, Zama, both of Japan, assignors to Atsugi Motor Parts Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 78,820, Sep. 25, 1979, abandoned. This application Jan. 26, 1981, Ser. No. 228,297

Claims priority, application Japan, Oct. 2, 1978, 53-121860

Int. Cl.³ B60G *21/006*

U.S. Cl. 180—41 **8 Claims**



1. In a vehicle comprising an engine, a battery, an ignition switch and a vehicle suspension system including a fluid-operated self-levelling suspension unit, an electrically controlled fluid pressure control valve for the suspension unit, and an electric vehicle-level control device for producing an output for actuating the fluid pressure control valve, said electric vehicle-level control device comprising:

(a) level detecting means responsive to variation in the level of a vehicle body over a road surface for producing a signal in response to a vehicle level higher or lower than a predetermined level,

(b) control circuit means responsive to the signal from said detecting means and controlling said valve on the basis of said signal, said control circuit means including a timing means for generating an output signal at a predetermined time after the signal from the detecting means is fed to the control circuit, and

(c) a battery energy feeding circuit responsive to said ignition switch to supply energy stored in said battery to said control circuit means, said battery energy feeding circuit comprising switching means for selectively supplying battery energy to the control circuit means, and an off-delay circuit responsive to said ignition switch to produce a command for maintaining said switching means closed for a predetermined time period following an opening of said ignition switch.

4,349,078

MOUNTING FOR A HEAT PRODUCING ELEMENT OF AN AUTOMOBILE

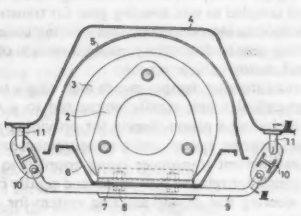
Junichi Shimada, Ooi, and Kazutake Ogawa, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.), Tokyo, Japan

Filed Jul. 10, 1980, Ser. No. 168,469

Claims priority, application Japan, Jul. 16, 1979, 54/96773[U]

Int. Cl.³ B60K *13/04*

U.S. Cl. 180—69.1 **7 Claims**



1. A mounting for a heat-producing element of an automobile exhaust system which includes an upper heat shield fixedly mounted above the heat-producing element to the underside of the automobile in spaced relationship therewith, said upper shield having downwardly extending flanges paralleling a longitudinal axis of the heat-producing element and covering an upper surface and a substantial portion of the side surfaces of said heat-producing element,

said mounting comprising

a lower heat shield rigidly attached to said heat-producing element in spaced relationship therewith covering a lower surface thereof and having a bottom portion and upwardly extending flanges at its longitudinal edges extending upwardly into said flanges of said upper heat shield defining therebetween ventilation openings,

a mounting bracket positioned adjacent the side of said lower heat shield remote from said heat-producing element and having lateral extensions perpendicular to said longitudinal axis, and

elastic members connected to said lateral extensions and attached to a body member of the automobile,

said upwardly extending flanges having portions which extend laterally for shielding said elastic members from heat radiated from said heat-producing element, said ventilation openings extending longitudinally and opening downwardly, said bottom portion and said flanges of said lower heat shield dissipating heat conducted from said heat producing element, said mounting bracket and said elastic members being positioned completely exteriorly of said heat shields and exposed to air flow beneath the automobile.

4,349,079

POWER STEERING FOR MOTOR VEHICLES

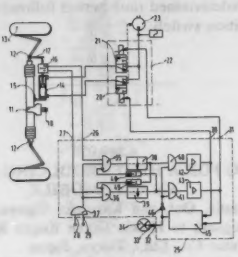
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,877

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2900510

Int. Cl.³ B62D 5/06

U.S. Cl. 180—143 12 Claims



1. Power steering system for motor vehicles comprising

a steering column,

a steering gear coupled to said steering column,

a tie rod coupled to said steering gear for transmitting transverse motion introduced by said steering column and said steering gear to direct the running direction of at least one of said motor vehicle wheels,

a hydraulic steering damper means including a two-chamber piston-cylinder unit rigidly connected to a vehicle axle and including a piston therein for providing power assist to said steering system and a measurement transducer,

said measurement transducer being coupled to one end of said piston for relative movement and rigidly connected to said steering rod of said steering system for determining relative movement of said piston,

a final control element for controlling movement of said piston in said two-chamber piston-cylinder,

said two-chamber piston-cylinder unit being connected via hydraulic lines to said final control element of said system for controlled movement of said piston, and

a control device electrically connected to said measurement transducer and triggered by an output of said measurement transducer to supply control pulses to said final control element.

4,349,080

DRIVE UNIT FOR LAND VEHICLES

Heinz Brockmann, Bad Homburg, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,389

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852411

Int. Cl.³ B62D 11/02

U.S. Cl. 180—301 2 Claims

1. A drive unit for a tracked armored land vehicle, wherein the vehicle is defined by a body having front and rear ends extending generally across a longitudinal axis and sides extending generally parallel but in spaced relation to the longitudinal axis;

a gas turbine including a gas generator section and a vehicle drive section aligned with and positioned aft of the gas generator section, the gas turbine having a longitudinal axis and being mounted within the vehicle body with the gas generator section positioned in front of the vehicle drive section and with the longitudinal axis of the gas generator displaced laterally but extending parallel to the longitudinal axis of the vehicle body;

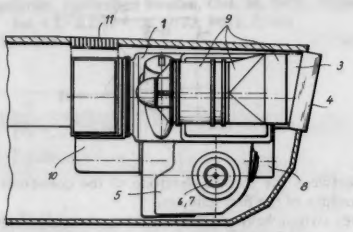
an air inlet in front of the gas generator section of the gas turbine;

an exhaust aft of the vehicle drive section of the gas turbine;

drive axle means for driving the vehicle mounted in the vehicle body and extending perpendicular to the longitudinal axis of the vehicle body;

a transmission having a longitudinal axis coextensive with the drive axle means, the transmission and drive axle means being mounted in the vehicle body beneath the gas turbine and extending perpendicular to the gas turbine;

means for connecting the vehicle drive section of the gas turbine to the transmission, said connecting means extending vertically down from the vehicle drive section to the transmission aft of the transmission;



auxillary connection means for connecting the gas turbine to drive auxiliary drive devices within the transmission by connecting the gas generator thereto, said auxillary connecting means extending down from the gas generator in front of the transmission, and

an oil cooler for the gas turbine and vehicle, the oil cooler having a longitudinal axis extending parallel with the axis of the gas turbine and being mounted beside the gas turbine on top of the transmission whereby a compact power supply and drive unit is provided for the vehicle.

4,349,081

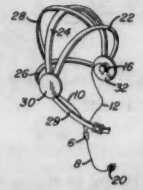
METHOD FOR RETAINING A HEARING AID IN PLACE AND HEARING AID HARNESS

Audrey Pepple, R.D. 1, Box 472, East Freedom, Pa. 16637

Filed Dec. 8, 1980, Ser. No. 214,110

Int. Cl.³ H04R 25/00

U.S. Cl. 181—130 13 Claims



6. A hearing aid retainer harness for a child comprising

a plurality of transverse strap members,

a longitudinal step member secured to at least some of said transverse strap members,

at least one ear cover secured to said transverse strap members,

said transverse straps, longitudinal strap and ear cover made of natural or synthetic fiber material,

said ear cover being composed of a flexible material which is generally porous to air and is electrically and magnetically generally nonconductive,

said harness being of such size as to fit a child, and

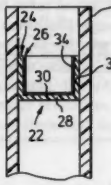
chin strap means for securing said harness to a child's head with said ear cover in intimate hearing aid retaining positioning.

4,349,082

ACOUSTICAL DAMPING ELEMENT AND METHOD OF FORMING SAME

William J. Gastmeier, Waterloo, Canada, assignor to Unitron Industries Limited, Kitchener, Canada

Filed Dec. 22, 1980, Ser. No. 219,394
Int. Cl.³ H04R *25/00*; G10K *11/02*
U.S. Cl. 181—130 6 Claims



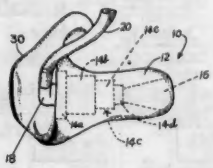
1. In a sound conducting member having an interior passage defined by a cylindrical interior wall, an acoustical damping element comprising: a flexible fabric member of selected acoustic resistance, a wire screen overlying said fabric member and being separate from and unattached to said fabric member, said wire screen and fabric member each having a central circular portion positioned across said interior passage, and each having a periphery bent into a cylindrical sidewall, the cylindrical sidewall of said screen overlying the cylindrical sidewall of said fabric member and pressing the cylindrical sidewall of said fabric member against each interior wall, said fabric member being held in said passage substantially solely by the pressure of said cylindrical sidewall of said screen against said cylindrical sidewall of said fabric member.

4,349,083

ACOUSTIC EAR MOLD

Harry Bennett, 1358 N. Fresno St., Fresno, Calif. 93703

Filed Apr. 13, 1981, Ser. No. 253,710
Int. Cl.³ A61B *7/02*
U.S. Cl. 181—135 6 Claims



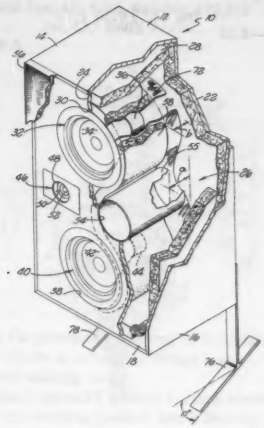
1. An acoustic ear mold for amplifying sound energy, the ear mold comprising a body having a component dimensioned to be received in the ear canal of a wearer, said component having a vent chamber therein communicating with the exterior of the component through a sound-discharge opening and a resonating cavity communicating with the vent chamber at one end and the exterior of the body at an opposite end remote from said vent chamber so as to form a passage composed of the resonating cavity and vent chamber extending through the body and said resonating cavity having a plurality of chambers aligned in series relation and being of progressively smaller transverse dimension in the direction of said vent chamber for amplifying sound energy received in said resonating cavity.

4,349,084

CONTROLLED AMBIENCE SPEAKER SYSTEM

Marco Karpodines, 9826 Pico Blvd., Los Angeles, Calif. 90035

Filed Dec. 24, 1980, Ser. No. 220,222
Int. Cl.³ H04R *1/28*; H05K *5/00*
U.S. Cl. 181—146 21 Claims

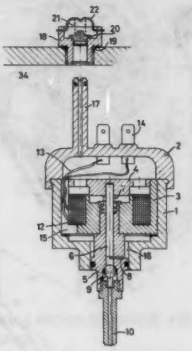


1. A controlled ambience speaker system comprising:
a housing having a back panel, side panels and a speaker mounting panel for defining an acoustic chamber, the front speaker mounting panel having at least one ducted port opening, at least one first driver opening, at least one second driver opening and at least one tweeter opening;
a first driver mounted to the panel for projecting sound through the first driver opening;
a second driver mounted to the panel for projecting sound through the second driver opening;
a tweeter mounted to the panel for projecting sound through the tweeter opening, the first and second drivers and tweeter being interconnected in parallel;
an open-ended duct member mounted to the panel about the periphery of the ducted port opening and having a length extending into the ducted port portion of the speaker chamber and terminating a first distance from the back panel;
an acoustic covering comprising a layer of packed fibrous material disposed to cover the back and side panels in the speaker chamber;
a sound absorbing acoustic curtain positioned in the acoustic chamber to bifurcate the acoustic chamber into a speaker portion and a ducted port portion, the curtain comprising a first layer of packed fibrous material having a length extending from the front panel and terminating at a terminating edge a second distance from the back panel, and at least one second layer of loose fibrous material extending substantially between the front panel and back panel, the acoustic curtain being loosely mounted between two opposing side panels for moving in response to the sound generated by the first and second drivers and tweeters whereby the distance between the back of the first driver and the ducted port opening and the second driver and the ducted port opening around the terminating edge of the acoustic curtain is sufficiently short to enable the back-wave sound in the midrange frequencies from the first and second drivers to be projected outwardly from the ducted port without being substantially absorbed in the speaker portion; and
a quantity of chamber filler comprising loosely packed fibrous material substantially filling the speaker portion of the speaker chamber.

4,349,085
OIL LUBRICATION SYSTEM

Erich Roser, Dorfstrasse 17, Salem-Grasbeuren, Fed. Rep. of Germany D-7777

Filed Aug. 25, 1980, Ser. No. 180,988
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936374
Int. Cl.³ F01M 1/02
U.S. Cl. 184—6.15 5 Claims



1. An oil lubricating system particularly for use in delivering lubricating oil to a plurality of lubricating points in a knitting machine, comprising: an oil reservoir containing a bulk quantity of lubricating oil, a plurality of individually operable lubricating pumps at least equal in number to the number of lubricating points for applying lubricating oil to the individual points in the knitting machine, each of said pumps including oil inlet means communicating with said oil reservoir to permit a quantity of lubricating oil to be conveyed to the interior of said pump, oil outlet means through which lubricating oil is conveyed for application to the lubricating point associated with the pump, an electromagnetically-operable plunger means operatively coupled to said oil outlet means, said plunger means being activated periodically to permit a quantity of lubricating oil to be conveyed through said oil outlet means, and means independent of the operation of said knitting machine for controlling the number of activations of said plunger means so that the quantity of lubricating oil delivered to a lubricating point within a preselected time period can be precisely determined and controlled.

4,349,086
CIRCULATING FOOD DISPLAY SYSTEM

Hideo Yamada, 4-4-17, Ichikawa, Ichikawa-shi, Chiba-ken, Japan

Filed Jul. 22, 1980, Ser. No. 171,200
Claims priority, application Japan, Jul. 27, 1979, 54-103708[U]
Int. Cl.³ E04H 3/04
U.S. Cl. 186—49 4 Claims

1. A circulating food display system used for circulating food for exhibition in a restaurant, comprising:

a food display case, disposed on the boundary between the interior and exterior of the restaurant and having a window facing said exterior;

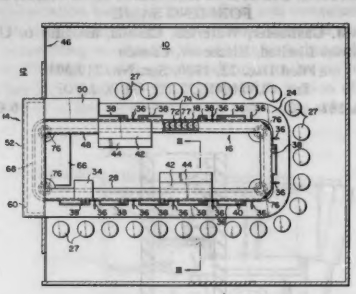
a covering means covering said window for preventing dust from entering into said food display case through said window but through which the interior of said food display case is viewed from said exterior;

a guide means defining an endless circulating path extending in said interior of said restaurant and in the interior of said food display case;

a counter disposed along a part of the outside peripheral edge of said guide means which is located in said interior of said restaurant;

a transparent shelter means sheltering a part of said guide means which is located in said interior of said restaurant, and having openings opened toward said counter;

liquid supply means disposed along said part of the outside



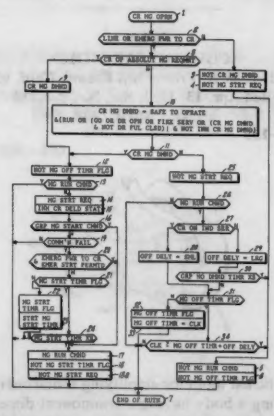
peripheral edge of said guide means and supplying liquid to a customer or customers sitting or standing at said counter;

endless conveyor means disposed in said endless circulating path and having a crescent chain and driving means for driving said crescent chain and having a circulating locus continuously extending within a horizontal plane.

4,349,087
ELEVATOR MOTOR/GENERATOR RUN PROTOCOL

Joseph Bittar, Simsbury, and Frederick H. Nowak, Southington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Feb. 13, 1981, Ser. No. 234,079
Int. Cl.³ B66B 1/18
U.S. Cl. 187—29 R 10 Claims



1. An elevator system including a plurality of elevators movable in related shaftways having access to floor landings of a building for servicing the landings, each of said elevators comprising:

a car;

motion means, including a DC motor and a motor generator (MG) set for providing power to said motor, for moving said car to selected landings in response to demands for service; and

signal processing means for providing an MG run command

signal to said motion means for causing said motion means to run in response to demands for service;

characterized by:

said signal processing means comprising means responsive to demands for service for providing a car MG demand signal, for providing said MG run command signal to said motion means in response to said car MG demand signal, for providing, in response to the presence of said car MG demand signal concurrently with the absence of said MG run command signal, an MG start interval timer initiation signal, for providing an MG start timer excess signal after a predetermined time interval following the provision of said MG start interval timer initiation signal, and for providing said MG run command signal in response to said MG start timer excess signal, the predetermined time interval of the signal processing means of one of said elevators differing from that of another one of said elevators by a time increment related to the time required to accelerate said MG set from rest to approximately rated speed.

4,349,088

DEVICE FOR CONTROLLING A LOCK-UP CLUTCH IN AN AUTOMATIC TRANSMISSION WITH A LOCK-UP CLUTCH EQUIPPED FLUID TORQUE CONVERTER

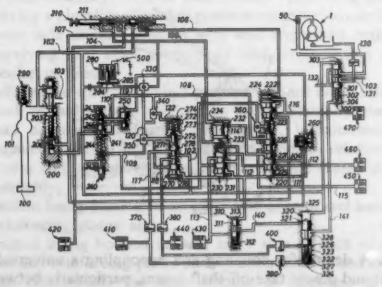
Takayoshi Ito, Anjo; Seitoku Kubo, and Yukio Terakura, both of Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Nov. 2, 1979, Ser. No. 90,579

Claims priority, application Japan, Nov. 7, 1978, 53-137069

Int. Cl.³ F16H *47/04, 47/06*

U.S. Cl. 192—3.3 **14 Claims**



1. A device for controlling a lock-up clutch in a automatic transmission having a torque converter equipped with a lock-up clutch, comprising

oil pressure passage means for supplying input oil pressure to hydraulic servo means;

a transient release valve responsive to a balance between said input oil pressure and line pressure, said transient release valve delivering an output oil pressure when said input oil pressure is above a first predetermined value;

and a lock-up shift valve responsive to a balance between said output oil pressure and line pressure, said lock-up shift valve adapted to engage said lock-up clutch when said output oil pressure is above a second predetermined value and to disengage said lock-up clutch when said output oil pressure is below said second predetermined value.

4,349,089

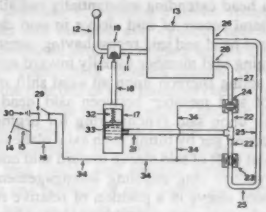
AUTOMATIC TRANSMISSION SHIFT LOCKING DEVICE

Cecil H. Finney, Pensacola, Fla., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 15, 1980, Ser. No. 112,373

Int. Cl.³ B60K *41/26*

U.S. Cl. 192—4 A **7 Claims**



1. Apparatus for preventing shifting of a vehicle transmission while the vehicle is in motion, comprising:

(a) vehicle gear shifting means;

(b) fluid pressure operated vehicle braking means movable between a non-braking position and a braking position;

(c) a hydraulically operated movable locking means adapted, when transmission fluid pressure is applied to said locking means, to immovably lock said gear shifting means when said braking means is in a non-braking position and, when the transmission fluid pressure is removed, release said gear shifting means when said braking means is in a braking position, said transmission fluid pressure being provided by the vehicle's transmission fluid, which is adapted to flow from the vehicle's automatic transmission to the locking means and back to the automatic transmission via a fluid circuit means; and

(d) transmission fluid pressure regulator means which controls the flow of transmission fluid between the locking means and the vehicle's automatic transmission, said regulator means actuated by said braking means via an electrical circuit means.

4,349,090

CLUTCH ASSEMBLY FOR GEAR TRANSMISSION

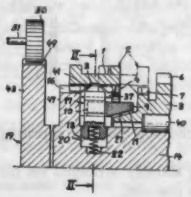
Walter Griesser, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 141,150

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915965

Int. Cl.³ F16D *23/06*

U.S. Cl. 192—53 G **6 Claims**



1. In a gear transmission having a first gear, a second gear coaxial with said first gear, said gears being provided with respective sets of teeth of like pitch and diameter, and an internally toothed sleeve meshing only with the teeth of said first gear in a decoupling position, said sleeve being axially slidable into a coupling position in which it meshes with the

teeth of said first and second gears for positively connecting same to each other,

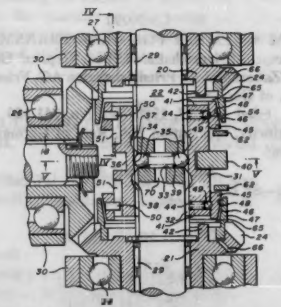
the combination therewith of a synchro ring coaxially interposed between said gears with freedom of limited rotation relative to said first gear, said synchro ring and said second gear being provided with confronting clutch surfaces separated by a small clearance from each other in the decoupling position of said sleeve, a spring-loaded rocker member with a foot pivotally received in said first ger and with a head extending substantially radially into an inner peripheral recess of said sleeve in said decoupling position, said head and said recess having camming formations for urging said member radially inward against the spring force acting thereon upon an axial shift of said sleeve, a part of said member between said head and said foot bearing upon said synchro ring for urging same toward said second ger by tilting in an axial plane in response to an incipient shift of said sleeve toward said coupling position, said synchro ring enabling disengagement of said head from said sleeve in a position of relative rotational alignment of said gears to permit said shift to be completed, and a pair of webs on said synchro ring laterally bracketing said member and cammingly coacting therewith in a position of rotational disalignment of said synchro ring relative to said first gear to resist disengagement of said head from said sleeve and thereby to prevent a complete shift of said sleeve into said coupling position, such disalignment resulting from a speed difference between said first and second gears upon the establishment of frictional contact between said clutch surfaces by an axial thrust exerted upon said synchro ring by said member, said webs being repressible by said sleeve through the intermediary of said member for establishing said relative rotational alignment upon the substantial elimination of said speed difference.

4,349,091

SYNCHRONIZED DOG CLUTCH

Hajime Miyake, Nagaokakyo; Osamu Matsumoto, and Fumio Dohi, both of Kyoto, all of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Japan

Filed Nov. 12, 1980, Ser. No. 206,075
Int. Cl.³ F16D *23/04, 21/04*
U.S. Cl. 192—53 F **4 Claims**



1. A synchronized dog clutch comprising:

a clutch shaft;

a coupling sleeve slidably arranged on the clutch shaft and having claws at one end;

a synchronizer ring arranged on the clutch shaft having a conical face for frictional engagement at an outer periphery, said coupling sleeve and said synchronizer ring being individually slidable with respect to the clutch shaft and rotatable together with the clutch shaft;

a gear wheel coaxially and rotatably arranged with respect to the clutch shaft and having teeth at an outer periphery, said gear wheel being provided with claws and a conical face respectively engagable with said claws and said conical face;

said coupling sleeve being arranged for said sliding movement on the clutch shaft together with the synchronizer ring, with the conical face of the synchronizer ring being first engaged with the conical face of the gear wheel before said engagement of the claws;

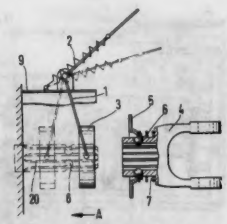
said coupling sleeve being splined to the outer periphery of the clutch shaft and said synchronizer ring being fitted to the outer periphery of the coupling sleeve and with the conical face of the gear wheel disposed closely and radially inside the outer teeth, and with the claws of the gear wheel disposed radially inside the conical face, wherein a groove extending lengthwisely of the clutch shaft is formed at one of the faced peripheral surfaces of the coupling sleeve and the synchronizer ring, and wherein a pin entering said groove projects from the other one of said surfaces, said groove having a hollow portion on the side edge thereof with a round chamfer therebetween, and wherein the coupling sleeve is fitted to the synchronizer ring so that the pin may travel within the groove along the circumference of said surfaces; the pin being pressed to the edge of the hollow portion, when the rotation of the synchronizer ring is not synchronized with that of the gear wheels, so that the coupling sleeve is prevented from sliding axially relatively with respect to the synchronizer ring until synchronization is achieved.

4,349,092

DEVICE FOR COUPLING AND UNCOUPLING A UNIVERSAL JOINT SHAFT

Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 948,218, Oct. 3, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,360
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1977, 2745628
Int. Cl.³ F16B *21/07*; F16D *11/10*
U.S. Cl. 192—67 R **7 Claims**



1. A device for coupling and uncoupling a universal joint shaft and power take-off shaft means, particularly between an agricultural implement and a tractor, comprising: a coupling sleeve adapted to be coaxially coupled in driving engagement with said power take-off shaft means; locking means for axially locking and unlocking said sleeve and said power take-off shaft means; lock spring means biasing said locking means to the locked position; a control ring movable in generally parallel relationship with said power take-off shaft means between a first and a second position, said control ring when moved to said second position operating to engage said locking means to unlock said sleeve from said power take-off shaft means; pivotally mounted stripping means having said control ring mounted thereon; lever means adapted to engage said stripping means for actuating said control ring from said first to said second position; overcenter snap spring means operatively associated with said stripping means for enabling said control ring to be selectively snapped to said first and second position and for retaining said control ring at said positions under a spring-biasing force; said control ring, when in said first posi-

tion, being out of engagement with said locking means to enable said locking means to maintain the locked engagement between said coupling sleeve and said power take-off shaft means; guide means extending parallel to said power take-off shaft means engaging said control ring to maintain movement of said control ring between said first and second positions generally parallel to said power take-off shaft means, said guide means comprising means mounted on opposite sides of said control ring defining guide slots; and guide members extending parallel to the power take-off shaft means slidably engaging said guide slots.

4,349,093

CLUTCH FACING

Hisami Tsujio, Okazaki, Japan, assignor to Aisin Seiki Company, Limited, Kariya, Japan

Filed Jan. 17, 1979, Ser. No. 4,196
Claims priority, application Japan, Jan. 20, 1978, 53-6118[U]
Int. Cl.³ F16D *13/64, 69/04*
U.S. Cl. 192—107 R **6 Claims**

1. A clutch facing secured to a clutch driven assembly comprising:

a first and second annular reinforcing plate;

a plurality of rivets including head portions for securing each of said annular reinforcing plates to said clutch driven assembly, each of said annular reinforcing plates having a plurality of pocket portions extended towards an inner side thereof, aligned with said rivets and entirely receiving said head portions of said rivets within said pocket portions;

a deformable spring member position on said inner side of each of said annular reinforcing plates, normally biasing said annular reinforcing plates apart, interconnecting adjacent rivets of said first and second annular reinforcing plates and operatively associated with said clutch drive assembly;

a friction lining bonded on an outer side of each said annular reinforcing plates; and

a second lining bonded on said inner side of each of said annular reinforcing plates and wherein said second lining has substantially the same amount of thickness as the height of said pocket portions of each of said reinforcing plates; wherein

said head portions of said rivets do not project beyond said outer side of each of said annular reinforcing plates.

4,349,094

HYDRAULIC DEVICE FOR MODULATED ACTUATION OF FRICTION CLUTCHES

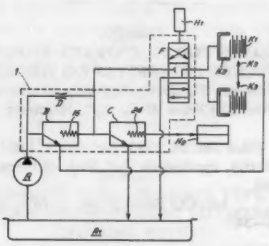
Franco Pavesi, Milan, Italy, assignor to Transfluid s.r.l., Milan, Italy

Filed Aug. 2, 1978, Ser. No. 930,212
Claims priority, application Italy, Aug. 16, 1977, 26734 A/77
Int. Cl.³ F16D *13/58*
U.S. Cl. 192—109 F **15 Claims**

1. A device for modulated operation of a pressure fluid actuator for a clutch, and a supply duct for supplying actuating pressure fluid to said clutch from a fluid pressure source, said device being fitted in the supply duct from the pressure source to the clutch, the device comprising:

a cylinder-piston assembly having first and second chambers connected respectively with the pressure source end of said duct and to the actuator end of said duct and having a movable part urged in one direction by force accumulating means, and at least one calibrated orifice in parallel to said cylinder-piston assembly, said cylinder-piston assembly including a cylinder, said movable part of said cylinder-piston assembly comprising a piston reciprocable in said cylinder and dividing said cylinder into said chambers, said calibrated orifice extending axially through said piston and maintaining communication between said chambers, the first one of said chambers being open to said supply duct from the pressure source and the second said chamber being open to the part of the duct connected to said clutch, a passage for supplying fluid to lubrication nozzles of said clutch, said passage opening to said first chamber in one position of said piston and being blocked in another position of said piston, said force accumulating means comprising spring means urging said piston toward said first chamber and into said blocking relation with said passage;

means for sensing the pressure in the second chamber of said



cylinder-piston assembly, said sensing means including means for controlling communication between said second chamber and a discharge port and combined with means for controlling and counteracting the pressure in said second chamber so that the filling of said actuator is effected in a fixed period of time during which the pressure of the fluid within said second chamber increases gradually and once limit pressure is attained within the second chamber of the cylinder-piston assembly a connection is established with said discharge port, said limit pressure being maintained practically constant, said controlling and counteracting means including a further cylinder containing a further piston dividing said further cylinder into third and fourth chambers, said third chamber communicating with said second chamber and defining part of said sensing means, further spring means urging said further piston toward said third chamber, said further piston being shiftable toward said fourth chamber against said further spring means, a further passage connected to said discharge port and thence connectable to the return side of said pressure source and opening to said third chamber with said further piston urged against said further spring means into said fourth chamber and closable by said further piston with the latter advanced into said third chamber by said further spring means.

4,349,095

COIN DISCRIMINATING APPARATUS

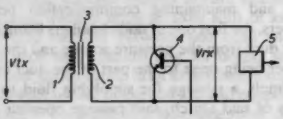
Christopher M. Lewis, Newmarket, England, assignor to P A Management Consultants Limited, London, England

Continuation-in-part of Ser. No. 12,699, Feb. 16, 1979, abandoned. This application Sep. 12, 1979, Ser. No. 74,646

Claims priority, application Japan, Feb. 19, 1977, 52-18272; United Kingdom, Feb. 18, 1978, 6539/78; Aug. 30, 1978, 34977/78; Fed. Rep. of Germany, Feb. 15, 1979, 2905828; Feb. 15, 1979, 7904191[U]; United Kingdom, May 9, 1979, 7916065

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A 16 Claims



1. A coin discriminating apparatus, comprising a transmitting coil connected to a signal generator so as to give an abrupt flux change, a receiving coil, the transmitting and receiving coils being disposed on opposite sides of a path for the passage of coins, means for short circuiting the receiving coil but effective to remove the short circuit a predetermined time delay after said flux change, and means responsive to the amplitude of a voltage pulse which is produced across the receiving coil in response to removal of said short circuit.

4,349,096

APPARATUS FOR TEMPORARY STORAGE OF STACKED CIGARETTES OR THE LIKE

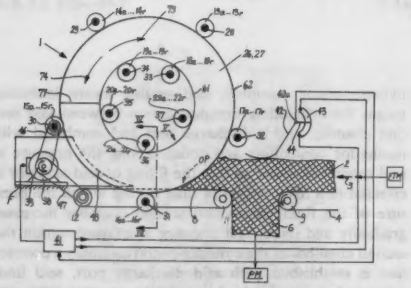
Theobald Thamerus, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 172,061

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930096

Int. Cl.³ B65G *37/00, 1/16*

U.S. Cl. 198—347 17 Claims



1. Apparatus for temporary storage of stacks consisting of rod-shaped articles of predetermined length, particularly for temporary storage of multi-layer streams consisting of cigarettes, filter rod sections or analogous articles which constitute or form part of rod-shaped smokers' products, comprising a reservoir including two coaxial helically convoluted walls rotatable about a common axis and defining a helical chamber arranged to store a stack of articles and having a width which at least equals said predetermined length, said walls having surfaces which flank said chamber and face each other and said chamber further having an opening for admission of a stack of articles into its interior in response to rotation of said walls about said common axis; guide means defining a path along which said walls can move about said common axis at a predetermined pitch; and retaining means provided on at least one of said surfaces of said walls and arranged to normally hold the articles of the stack in said chamber against movement relative to said walls.

4,349,097

LOADING AND UNLOADING DEVICE TO BE INSTALLED BETWEEN TWO CONSECUTIVE MACHINES

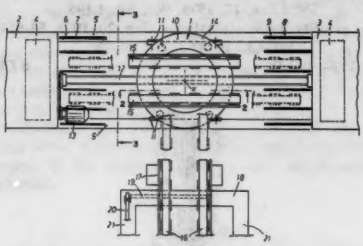
Ezio Curti, Via le Regina Giovanna 38, Milano, Italy

Continuation of Ser. No. 44,188, May 31, 1979, abandoned. This application May 11, 1981, Ser. No. 262,642

Claims priority, application Italy, Jun. 2, 1978, 24148 A/78

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—369 8 Claims



1. A first loading and unloading device arranged between two consecutive machines, in which a known unloading device, adjustable in height and interlinked with the outlet of the first working machine and a second known loading device, adjustable in height and interlinked with the inlet of the second working machine, are selectively interconnected by said device which comprises a movable trolley running longitudinally on rails between the two machines with the said trolley rotatingly supporting a horizontal platform carrying in turn a pair of parallel driven conveyor belts which can be interlinked with the unloading device of the first machine and with the loading device of the second machine, and selectively with a vertically adjustable second loading and unloading means positioned between the two machines and spaced laterally from one side of the path of movement of said trolley.

4,349,098

CONVEYOR BELT CLEANING OR SCRAPING DEVICES

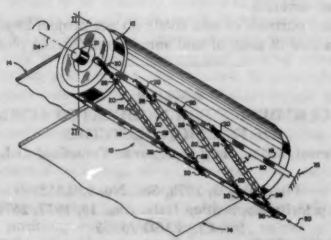
Willem D. Veenhof, R.R. 4, Hillview No. 1, Heath, Tex. 75087

Filed Sep. 4, 1980, Ser. No. 184,044

Claims priority, application South Africa, Sep. 7, 1979, 79/4738

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—497 10 Claims



1. A conveyor belt cleaning assembly for cleaning a conveyor belt in a region where the conveyor belt is in contact

with the curved surface of a pulley drum comprising, in combination:

first and second support bars adapted to be mounted in an operative position in the contact region, said first and second support bars extending generally in alignment with the axis of rotation of the pulley drum and being spaced apart in the operative position;

at least one elongated, flexible scraping member supported between the first and second support bars for engagement with the curved surface of the conveyor belt in the operative position, said elongated scraping member extending in a generally helical direction relative to the pulley drum when engaged with the conveyor belt in the operative position; and,

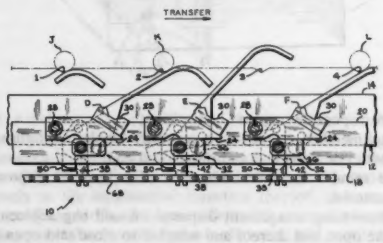
bias means coupled to said scraping member for maintaining said scraping member in yieldable, thrusting engagement with the curved surface of the conveyor belt in the operative position.

4,349,099

ACCUMULATING CONVEYOR

Douglas D. Wiknich, Holly, and Michael J. Peabody, Troy, both of Mich., assignors to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Apr. 28, 1980, Ser. No. 144,631
Int. Cl.³ B65G *25/00, 43/08*
U.S. Cl. 198—751 **19 Claims**



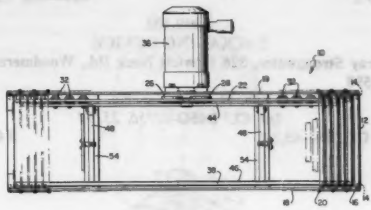
12. An accumulating conveyor comprising an elongated support along which a plurality of articles are movable forwardly through a series of longitudinally spaced-apart stations, a transfer bar mounted for movement back and forth longitudinally of said elongated support, a plurality of feed units supported solely on said transfer bar and spaced apart longitudinally of said elongated support, shaft means corresponding to each of said feed units, said shaft means extending through said transfer bar and constituting the support for said feed units, said feed units being pivotally movable about said shaft means between idle and feed positions, drive means for moving said transfer bar through a cycle commencing with an initial rearward movement of said transfer bar from a start position for moving each of said feed units from one station to the next adjacent station to advance the articles forwardly through the stations, means pivotally mounted on said transfer bar adjacent each of said feed units for pivotally moving said feed units about said shaft means from idle to feed positions, and sensing means at each station operable to sense the absence of an article, said sensing means being operatively associated with said moving means to cause all feed units behind an empty station to move to feed positions during rearward movement of said transfer bar from said start position.

4,349,100

CONVEYOR

John R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sep. 29, 1980, Ser. No. 192,010
Int. Cl.³ B65G *13/06*
U.S. Cl. 198—783 **6 Claims**



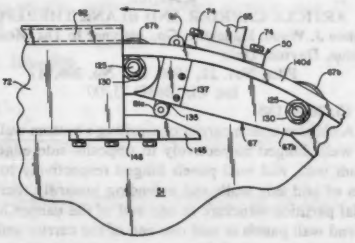
1. In a conveyor comprising a conveying surface, said conveying surface being formed of a plurality of free-wheeling rollers, and means for driving and braking said rollers, the improvement wherein said means for driving and braking said rollers comprises a bar positioned beneath said rollers and extending for a major portion of the length of said rollers, a pivot upon which said bar is mounted, a driving belt connected to one end of said bar for driving said rollers along one end thereof when said bar is pivoted to a first position, means for driving said driving belt, a braking belt connected to the other end of said bar for braking said rollers along the other end thereof when said bar is pivoted to a second position, means connected at one end of said bar to pivot said bar between said first position and said second position and adjustment means connected to the other end of said bar to regulate contact pressure between said belts and said rollers.

4,349,101

CONVEYOR OF ENDLESS CHAIN TYPE WITH ECCENTRIC ARRANGEMENT TO OVERCOME CHORDAL ACTION

John W. Eldred; James B. Legg, both of Columbus, and James A. Earley, Lancaster, all of Ohio, assignors to The Eldred Company, Columbus, Ohio

Division of Ser. No. 10,529, Feb. 9, 1979, Pat. No. 4,263,846. This application Dec. 24, 1980, Ser. No. 219,887
Int. Cl.³ B65G *17/06*
U.S. Cl. 198—851 **6 Claims**



1. A conveyor comprising a chain mounted by means including a plurality of sprockets for movement therearound, said chain being composed of interfitting links pivoted together at pivot axes, eccentrics at said pivot axes having sprocket-engaging surfaces, and means for rocking said eccentrics relative to said axes of the chain as it passes onto and off each sprocket; said rocking means including an oscillatable lever connected to each eccentric, said oscillatable lever being fixed to the eccen-

tric on one link and extending to a transversely mounted slide on the adjacent link to which the lever is connected, said slide extending outwardly from its mounting link at both sides and carrying a cam follower at each side, a cam guide extending along the conveyor for engaging with one of the cam followers and cams adjacent the sprockets for engaging with the other cam follower.

4,349,102
PACKAGING DEVICE

Murray Strongwater, 326 Hewlett Neck Rd., Woodmere, N.Y. 11598

Filed Feb. 11, 1981, Ser. No. 233,580
Int. Cl.³ B65D *75/56, 25/54*
U.S. Cl. 206—45.34 **3 Claims**

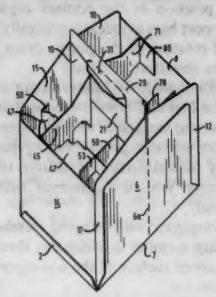
1. A packaging device comprising,
(a) a pair of shells adapted to be assembled into closing engagement to define an enclosure for an article of merchandise, each of said shells comprising a main body portion and a peripheral skirt, and the uppermost portions of said peripheral skirts being in overlapping relation when said shells are in said closing engagement,
(b) means defining a slot in the upper part of said enclosure, said means comprising a cutout in the upper central part of the peripheral skirt in each shell, and
(c) a hanger element extending through said slot and releasably securable to said enclosure at said upper part thereof for suspending said enclosure from said hanger element.

4,349,103
ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 21, 1980, Ser. No. 208,917
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—188 **8 Claims**

1. A cellular article carrier comprising a bottom wall, spaced side walls hinged respectively to opposite side edges of the bottom wall, end wall panels hinged respectively to the end edges of said side walls and extending inwardly therefrom, a medial partition structure at one end of the carrier hinged to said end wall panels at said one end of the carrier and extending medially inward of the carrier, a medial partition structure at the other end of the carrier hinged to said end wall panels at said other end of the carrier and extending medially inward of the carrier, partitioning means providing a plurality of individual article cells on each side of said medial partition structures, a handle structure comprising an inner handle structure provided by the medial partition structure at said one end of the carrier and an outer handle structure secured in overlapping relationship with respect to said inner handle structure and extending between the opposite end wall panels of the carrier, said outer handle structure including reinforcing straps hinged

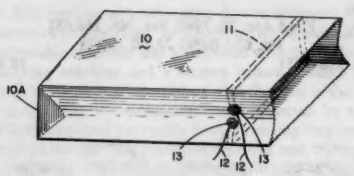


thereto and secured to the end wall panels at said one end of the carrier.

4,349,104
SCENTED DISPOSAL BAG

Paul R. Hayes, 806 S. Westvale Dr., Anaheim, Calif. 92804

Filed Feb. 9, 1981, Ser. No. 232,811
Int. Cl.³ B65D *47/10, 81/00*
U.S. Cl. 206—205 **5 Claims**



1. A disposable bag unit comprising,
a bag member comprising a generally tubular configuration with one open end and one closed end,
said tubular member comprised of a flexible, disposable material,
a drawstring arragement disposed on said bag adjacent to the open end thereof and adapted to close said open end when activated, and
means containing an odor-related material associated with said drawstring arrangement to selectively disperse said odor-related material within the confines of the bag when the drawstring is activated.

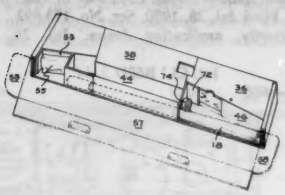
4,349,105
GUN CARTON

Michael F. Bradley, Feeding Hills, and Jack C. Viecelli, Agawam, both of Mass., assignors to Longview Fibre Company, West Springfield, Mass.

Filed Apr. 27, 1981, Ser. No. 257,813
Int. Cl.³ B65D *5/48, 5/50*
U.S. Cl. 206—317 **9 Claims**

1. A carton for housing the stock portion and barrel portion of a disassembled firearm in separate compartments, the carton comprising:
(a) a bottom panel with hinged end walls and a front and rear wall extending therefrom;
(b) stock cover panels for overlying the stock, said cover panels each having a first edge attached to the rear wall and an opposed second edge;
(c) a vertically foldable panel attached to the second edge of

each stock cover panel for longitudinally dividing the carton into front and rear compartments, one compartment for housing the stock and the other for housing the barrel; and



(d) means for holding a barrel in said carton, said means including a substantially V-shaped portion extending from the lower edge of one of said vertical panels and adapted to retain the barrel in stationary relation within said carton.

4,349,106

PLASTIC RIBBON FOR SUPPLY OF BOLT-LIKE FASTENER ELEMENTS

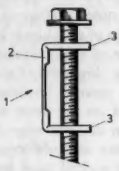
Gerhard Bögel, Heerbrugg, Switzerland, assignor to SFS Stadler AG, Heerbrugg, Switzerland

Filed Feb. 22, 1980, Ser. No. 123,782

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907486

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—347 **6 Claims**



1. An elongate supply ribbon of plastic material for supporting bolt-like fastener elements comprising: a back wall portion extending longitudinally of said ribbon; a plurality of tongues extending from opposite sides of said back wall portion transversely to the longitudinal direction thereof; receiving slots formed in each of said tongues adapted to receive in supporting engagement therein said fastener elements, said receiving slots being provided with an inlet opening and an adjoining widened opening for engaging a fastener element; bending regions extending the entire length of said ribbon on both sides of said back wall portion interposed between said back wall portion and said tongues operative to permit said tongues to be bent relative to said back wall portion into a position to lie within planes extending generally perpendicularly to the plane of said back wall portion, said bending regions being formed from contiguous integral parts of said back wall portion and of said tongues and having a thickness dimension which is greater than the thickness dimension of at least other parts of said back wall portion; and a pair of essentially contiguous notches formed, respectively, in each of said bending regions, each of said notches extending longitudinally of said back wall portion essentially along the entire length thereof and being defined by generally opposed bearing surfaces which are brought into abutting engagement with each other when said tongues are in said bent position relative to said back wall portion; said bearing surfaces of each of said notches being structured to be in abutting engagement with each other when said tongues extend at 90° to said back wall portion in order to support said tongues at said 90° angle when said fastener elements are engaged within said receiving slots and to prevent further bending of said tongues beyond said 90° angle.

4,349,107

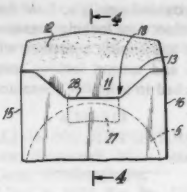
METER CHART ENVELOPE

Sheldon S. Pritchard, Houston, Tex., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 89,921, Oct. 21, 1979, abandoned, which is a continuation of Ser. No. 974,029, Dec. 28, 1978, abandoned. This application Jan. 23, 1981, Ser. No. 227,692

Int. Cl.³ B65D *85/00, 85/57*

U.S. Cl. 206—449 **1 Claim**



1. An elongated rectangular envelope for containing and locking therein a circular sheet member, said envelope comprising a front panel; a back panel, said back panel including a top edge portion and a pair of spaced apart, generally triangular cut portions extending downwardly from said top edge portion, said cut portions being disposed in mirror image relationship to one another; a pair of spaced apart, opposed side edges, said side edges defining the length of the envelope; a closed bottom edge portion, said bottom edge portion defining the width of said envelope; a top cover flap hingedly connected to said front panel along a first fold line; and a generally rectangular locking flap hingedly connected to said back panel along a second fold line defining its bottom edge, opposed side edges of said locking flap being disposed between said cut portions and substantially centered between said side edges, said locking flap including a terminal top edge substantially parallel to and colinear with the top edge portion of said back panel, the width of said envelope and the distance between said second fold line and said bottom edge substantially defining a square area such that when a circular sheet member is contained within the envelope, said locking flap may be folded into the envelope such that the sheet member is sandwiched between said back panel and said locking flap so as to minimize slippage of the sheet member within the envelope.

4,349,108

CONTAINERS

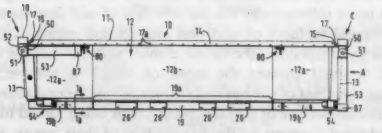
Derrick Sharpe, Chesterfield, England, assignor to W. H. D. Development Limited, Langwith Junction, England

Filed Apr. 17, 1980, Ser. No. 141,122

Claims priority, application United Kingdom, Apr. 19, 1979, 7913659

Int. Cl.³ B65D *21/04*

U.S. Cl. 206—506 **11 Claims**



1. A container comprising a load receiving body having a length of at least 3 meters and comprising an open topped box having a base wall and downwardly and inwardly inclined sidewalls whereby the body of a similar container can be nested therein, the body having retractable leg means comprising a plurality of fixed leg parts provided externally of the body at the upper end of the body, a movable leg pivotally connected at the upper end thereof to each fixed leg part

adjacent the upper end of the body for movement between an operative position, in which the movable legs extend downwardly and the lower ends thereof project below the base wall of the body and are adapted to support the weight of the body and to engage said fixed leg parts of a similar container there below upon which said one container is thereby stacked, to transmit said weight thereto, and an inoperative position in which said movable legs extend generally parallel to the top of the container and in which the bodies can be nested, leg locking means being provided rigidly to hold each movable leg in said operative position, first locking means to permit the container to be locked to a similar container when in nested relationship therewith and second locking means to permit the container to be locked to a similar container when in stacked relation therewith.

4,349,109

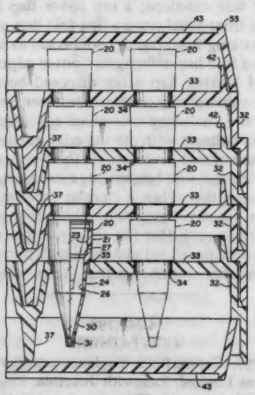
DISPOSABLE PIPETTE TIPS AND TRAYS THEREFOR

Emil A. Scordato, Eastchester, and Hugh W. Pratt, Pelham Manor, both of N.Y., assignors to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed Oct. 20, 1980, Ser. No. 199,045

Int. Cl.³ B65D *85/30, 21/00*

U.S. Cl. 206—562 **4 Claims**



1. A pipette tip comprising a first segment having a tapered internal surface adapted to accommodate the tapered end of a pipette; a second segment having a tapered internal surface adapted to accommodate the tapered end of a pipette, said surface having a diameter less than that of said first segment and a taper substantially the same as that of said first segment, the internal surfaces of said first and second segments being joined by a shoulder-like bevel; a third segment having a tapered internal surface the taper of which is substantially greater than that of the internal surface of said second segment, the internal surface of said second segment being joined to that of said third segment by the intersection of their tapers; and a tip segment having an internal surface that is tapered at an angle substantially less than that of said third segment and joined to the internal surface of said third segment by the intersection of their tapers, said tip segment serving as a nozzle to form and direct a liquid stream being discharged from the tip, and wherein said third segment serves as a reservoir when a liquid is aspirated by a pipette placed in said second segment, and said second and third segments serve as a reservoir when a liquid is aspirated by a pipette placed in said first segment.

4,349,110

SIZE-REDUCIBLE CONTAINER

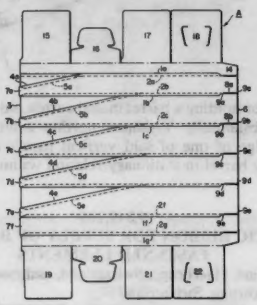
Masaho Hayashi, Tokyo, Japan, assignor to Dainippon Printing Co., Ltd. and Kanebo Foods, Ltd., both of Tokyo, Japan

Filed Jul. 28, 1980, Ser. No. 173,892

Claims priority, application Japan, Jul. 26, 1979, 54-103403[U]

Int. Cl.³ B65D *5/54*

U.S. Cl. 206—606 **3 Claims**



1. A size-reducible rectangular box-like columnar container made from a pre-patterned blank of a carton board exposing its outer side and having a mating cap member, comprising:

a plurality of spaced first horizontal tear-strip scored straight lines formed on the outer surface of said carton board to extend from one edge of said blank horizontally along the entire circumference of said container and to a depth of about one half of the thickness of said carton board;

a plurality of spaced second horizontal tear-strip scored straight lines formed on the inner surface of said carton board to extend from said one edge of said blank horizontally along the entire circumference of said container parallel to said first scored lines but in spaced relation thereto and to a depth of about one-half of the thickness of said carton board,

said scored lines being arranged in pairs of one outer line and one inner line located close to each other to provide an easy tear-strip means for each section of said container defined by adjacent of said pairs;

a plurality of separate gripping end portions, for being nipped by a user, formed along said one edge of blank between adjacent of said pairs and all protruding beyond a longitudinal corner line of the outer side of said container; and

a flap portion formed along the edge of said blank opposite said one edge and secured adhesively to the inner surface of the marginal portion of said one edge at said corner line, said flap portion having slits therein aligned with but spaced from the lines of each of said pairs and terminating short of said opposite edge to thereby provide connecting portions at the opposite ends of said slits that maintain integrity of said flap portion while facilitating sections thereof to be torn off with said tear-strip means.

4,349,111

PAPER CURRENCY DEVICE

Hasmukh R. Shah, Hot Springs, Ark.; Thaddeus M. Jones, and Bruce R. Hemingway, both of South Bend, Ind., assignors to UMC Industries, Inc., Stamford, Conn.

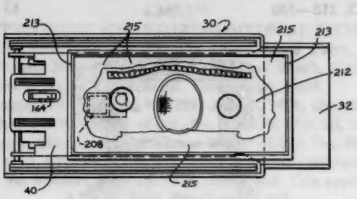
Filed Apr. 4, 1980, Ser. No. 137,425

Int. Cl.³ B07C *5/344*

U.S. Cl. 209—534 **46 Claims**

1. A bill-handling device that comprises a sensor which can respond to relative movement between itself and a line or area on an object to provide a first signal and subsequently provide

a second and oppositely-directed signal, motion-providing means to provide relative movement between said sensor and said object, said sensor responding to relative movement between itself and a line or area on said object, which moves said line or area on said object into register with it, to provide said first signal and thereafter responding to relative movement



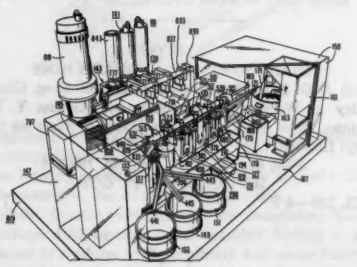
between itself and said line or area on said object, which moves said line or area on said object out of register with it, to provide said second and oppositely-directed signal, and means to indicate the detection of said line or area on said object if said first signal and said second and oppositely-directed signal are produced in a predetermined sequence and are produced within a predetermined short period of time.

4,349,112

PELLET INSPECTION APPARATUS

Robert S. Wilks, Plum Borough; Alexander Taleff, Churchill Borough, and Robert H. Sturges, Jr., Plum Borough, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 31, 1980, Ser. No. 136,122
Int. Cl.³ B07C *5/02*
U.S. Cl. 209—538 **39 Claims**



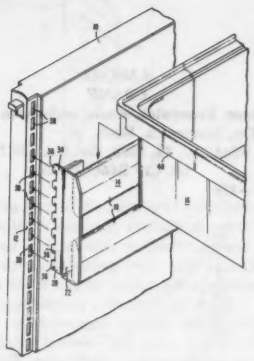
1. Apparatus for inspecting fuel pellets for a nuclear reactor including a plurality of inspection stations and means, cooperative with each of said stations, to inspect each of said pellets for a different property of said pellet, means mounting said stations in an array to receive and inspect each said pellet in succession, each said station inspecting said pellet in its turn for its associated property, means, connected to said stations, for feeding said pellets into the first station of said array, said pellet-feeding means having a pellet pick-up location where a pellet is moved to said first station; sorting means, connected to said stations, for receiving a pellet from the last station of said array and sorting said pellet in accordance with its properties, gripper means cooperative with said feeding means, said stations, and said sorting means, for gripping each said pellet in its turn and advancing said pellet from respective pick-up positions to respective deposit positions, namely from said pellet pick-up location, in a pick-up position to, said first station of said array, in a deposit position, from each station of said array, in pick-up positions, to a just succeeding station of said array, in deposit positions, and from the last station of said array, in a pick-up position, to said sorting means in a deposit position; the said gripper means including a separate gripper for advancing each said pellet from said pellet pick-up location to said first station of said array, a plurality of separate grippers each for advancing each said pellet from a station of said array to the succeeding station of said array, and a separate gripper for advancing each said pellet from the last station of said array to said sorting means, means connected to said gripper means, for actuating said separate grippers to move back and forth together between respective pick-up position and said respective deposit positions with which each said separate gripper is associated, and means for actuating each said separate gripper to engage a pellet at its pick-up position and to deposit said pellet at its deposit position.

4,349,113

WALL-HUNG SUPPORT RAIL

Charles P. Schreiner, Saugatuck, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 212,944
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—103 **8 Claims**



1. A support rail for use in connection with a panel or similar vertical support member having spaced vertical slotted standards thereon, said support rail comprising:

a pair of vertically spaced rail means,

a first L-shaped bracket secured to each end of said pair of rail means, and

a second L-shaped bracket secured to each of said first L-shaped brackets, said second L-shaped brackets including a plurality of hook-shaped connectors on one edge thereof constructed and arranged to co-act with a slotted standard to connect said support rail to a vertical surface.

4,349,114

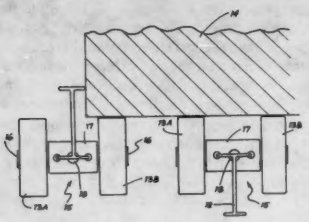
STORAGE RACK

Derek Vickers, Carlingford, and John C. Waterhouse, Allambie Heights, both of Australia, assignors to Fenamec (Australia) Pty. Ltd., Australia

Filed May 30, 1980, Ser. No. 155,151
Claims priority, application Australia, Jun. 11, 1979, PD9135
Int. Cl.³ B65G *13/00*
U.S. Cl. 211—151 **4 Claims**

1. A storage rack having at least one generally horizontally load supporting beam, said beam having at least one longitudinally extending web from which projects in a transverse direction a longitudinally extending flange, a plurality of wheel assemblies attached to the beam at longitudinally spaced locations, each wheel assembly including an axle body with a slot within which a portion of said flange and web are located thereby fixing the axle body to the beam, at least one wheel rotatably supported by the axle body, and wherein each axle

body is frictionally restrained from longitudinal movement by the axle body being resiliently biased to engage said flange and



said axler body is fixed against transverse movement by the web.

4,349,115

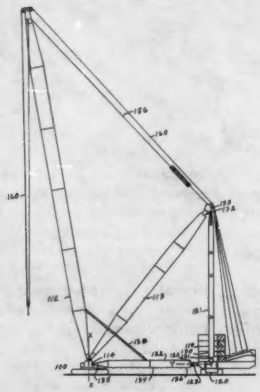
CRANE

Nell F. Lampson, Kennewick, Wash., assignor to Riggers Manufacturing Co., Kennewick, Wash.

Filed Apr. 14, 1980, Ser. No. 139,798

Int. Cl.³ B66C *23/08*

U.S. Cl. 212—178 **8 Claims**



1. A counterbalanced crane structure, comprising:

a ground supported crane base;

a main boom;

a platform mounting the main boom to the crane base;

a mobile counterweight unit remote from the platform;

rigging means operably connected between the counterweight unit and the main boom for positioning the main boom in an upright orientation;

an elongated stinger frame; and means at opposed ends of the stinger frame adapted to mount the stinger frame to the crane base and counterweight unit, respectively;

telescoping connector means along the stinger frame for permitting the counterweight unit to freely move a limited distance toward and away from the crane base parallel to the stinger frame and for permitting relative pivotal movement of the counterweight unit relative to the crane base about a longitudinal axis parallel to the stinger frame.

4,349,116

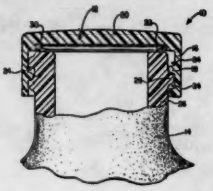
THERMOPLASTIC SCREW-THREADED CLOSURE CAP

Werner R. Luenser, Blue Island, Ill., assignor to Ethyl Products Company, Richmond, Va.

Continuation of Ser. No. 967,493, Dec. 7, 1978, abandoned. This application Jul. 25, 1979, Ser. No. 60,743

Int. Cl.³ B65D *41/04*

U.S. Cl. 215—330 **13 Claims**



1. A thermoplastic cap having an elastic modulus in flexure within the range of from about 0.2×10^5 to about 10^6 pounds per square inch and comprising:

a. a top wall;

b. an annular sidewall integrally formed with and downwardly depending from the top wall;

c. an inwardly extending primary helical thread about the inside surface of said sidewall for cooperation with a container helical thread; and

d. an inwardly extending secondary helical thread

i. about the inside surface of said sidewall,

ii. coaxial with said primary thread,

iii. displaced upwardly within the range of from about 0.010 to about 0.030 inches above said primary thread,

iv. having a vertical width within the range of from about 0.010 to about 0.030 inches, and

v. having a horizontal width within the range of from about 0.015 to about 0.035 inches.

4,349,117

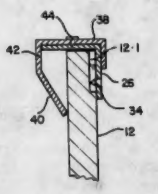
TRANSPORT AND STORAGE BINS

Kenneth J. D. Bain, Rondebosch; Dennis E. King, Goodwood; Lesley A. Worship, Stellenbosch, and Achmat T. Burton, Athlone, all of South Africa, assignors to Marsden (Proprietary) Limited, Cape Town, South Africa

Filed Sep. 25, 1980, Ser. No. 190,878

Int. Cl.³ B65D *6/24, 6/26*

U.S. Cl. 220—4 F **7 Claims**



1. An upwardly open, four sided transport and storage bin which comprises an upper metal structure in the form of a four sided frame, a lower metal structure in the form of a four sided frame corner posts joining the upper and lower metal structures, a plurality of slats, each slat having a first face which is directed inwardly of the bin and a second face which is directed outwardly of the bin, each side of the upper metal structure comprising a first part and a second part which together form a downwardly open channel for receiving the upper ends of the slats, said parts being separable to release the upper ends of the slats, the first part including a flange which extends downwardly adjacent said second faces of the slats and

a second part including a flange which extends downwardly adjacent the first faces of the slats, the last mentioned flange sloping outwardly of the bin in the downward direction whereby its upper edge is spaced from said slats and its lower edge abuts said first faces of the slats.

4,349,118

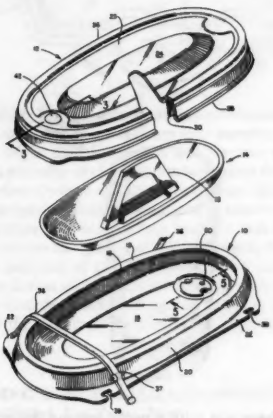
STERILIZING AND STORING MEDICAL ITEMS

Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Whelchel, Newport Beach, Calif., assignors to Roger S. Sanderson, Dana Point, Calif.

Continuation of Ser. No. 923,359, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 734,228, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,044, Jul. 6, 1976, Pat. No. 4,196,166, which is a continuation-in-part of Ser. No. 640,824, Dec. 15, 1975, abandoned. This application Apr. 28, 1980, Ser. No. 144,068

Int. Cl.³ A61L *2/06;* B65D *81/20*

U.S. Cl. 220—201 **3 Claims**



1. Apparatus for containing items while being sterilized or stored comprising:

means forming a container including a plurality of walls with an opening in one of the container walls;

a resilient, flexible valve member for controlling fluid flow through said opening, said member having a surface shaped to conform to the container wall around said opening, and having means for mounting said member on the container in a manner to cause said surface to engage the container thereby covering said opening;

temperature responsive means holding said valve member in an open position unnatural to the resilient tendency of the valve member wherein said opening is not covered by the valve member, said temperature responsive means including an element having first means attached to said valve member at one point on the exterior of said valve member and second means connected to the valve member at a second point on the exterior of the valve member spaced from said one point, the distance between said points as measured along the surface of the valve member being greater than the distance between said first and second means on said element as measured by a straight line connecting said first and second means so that said element is held in tension between said points due to the resiliency of said member and said resilient valve member is distorted into and held by said element in a configuration wherein an edge of said valve member is held in said open position, said temperature responsive means being responsive to a predetermined temperature to release said edge and allow the resilience of the valve member to move said edge to a closed position.

4,349,119

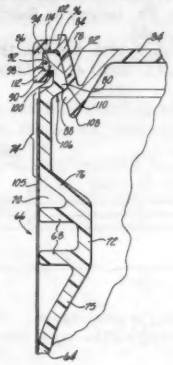
CONTAINER CONSTRUCTION

Ilija Letica, Oxford, Mich., assignor to Letica Corporation, Rochester, Mich.

Continuation-in-part of Ser. No. 169,330, Jul. 16, 1980, Pat. No. 4,293,080. This application Feb. 17, 1981, Ser. No. 235,245

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **13 Claims**



1. An injection molded thermoplastic container, comprising:

a body including a generally cylindrical sidewall, a bottom wall formed integral with said sidewall, and an open top spaced from said bottom wall, said sidewall including upper and lower axially spaced apart portions;

a reinforcement section radially inset relative to said sidewall, said reinforcement section being formed integral with said body between said upper and lower portions of said sidewall and defining a discontinuity in said sidewall adjacent said top thereof; and,

a label secured to said body and overlying at least parts of said upper and lower sidewall portions and said reinforcement section, said label conformingly engaging said parts of said upper and lower sidewall portions.

4,349,120

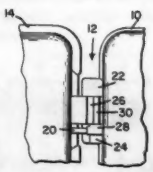
PLASTIC BOX HINGE

Richard DiNardo, Leominster, Mass., assignor to Bay State Plastics Corp., Leominster, Mass.

Filed Jun. 10, 1981, Ser. No. 272,301

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—337 **3 Claims**



1. A plastic box having an open rim, and a plastic cover therefor, integral hinge-forming means adjacent the rim of the box and corresponding and complementary hinge-forming means on the rim of the cover,

the hinge means on the box comprising a generally cylindrical member having a downwardly opening slot therein,

and the hinge means on the cover comprising a pin adapted to be snapped into the slot so as to hold the pin in a rotary manner in the hinge means on the box,

a tab associated with the pin on the cover and a tab associated with the cylinder member on the box, tabs being substantially coplanar in a plane transverse to the axes of the pin, said tabs being arranged to contact each other and act as stops when the cover is open to a 180° relationship with respect to the box.

4,349,121

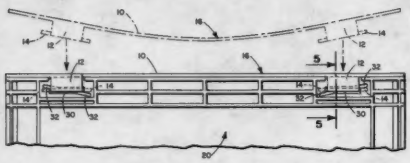
CASE WITH HINGED LID ASSEMBLY

James Lafferty, Erie, Pa., assignor to Rehrig Pacific Corporation, Los Angeles, Calif.

Filed Feb. 9, 1981, Ser. No. 232,629

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—341 **7 Claims**



1. A case comprising in combination:

at least one upstanding wall having at least one hinge receiving slot;

at least one separate unitary flexible cover including a hinge member comprising a tab projecting from said cover, said tab having a first portion of a first width and a second outer portion of second larger width;

said slot comprising a first slot portion of sufficient width to admit only the first portion of said tabs and a second wider slot portion forming slot extensions of sufficient width to admit the second portion of said tab;

said second tab portion adapted to be retained in said slot when said cover is unflexed to allow pivotal movement of said cover with respect to said wall, said cover attachable to said wall upon flexing of said cover to cause said second tab portion to enter said second slot portion, wherein said cover is retained in said slot in a pivotal state upon release of said cover to an unflexed condition.

4,349,122

SEALING ELEMENT

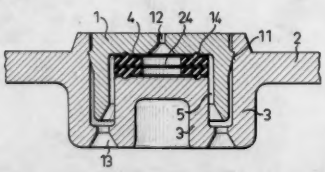
Rudolf Klar, and Ulrich Beier, both of Northeim, Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,815

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015775

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—373 **9 Claims**



1. An annular sealing element for placement between rigid surfaces adapted to rest upon one another, said sealing element comprising:

at least one insert of textile fibers which extend essentially transverse to the sealing direction, said insert having outer peripheral edges, inner peripheral edges, and opposing surfaces extending between and connected by said peripheral edges; and

on each of said opposing surfaces, an uninterrupted layer of elastomeric material selected from the group consisting of rubber and rubber-like synthetic material, said insert being covered by said respective elastomeric layers in such a way that said outer and inner peripheral edges of said insert are exposed.

4,349,123

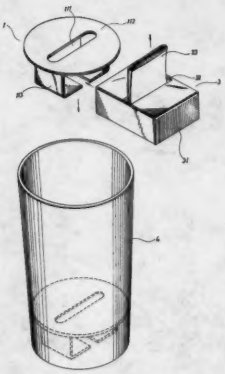
GARBAGE CAN WITH A PACKAGED AND FOLDED PLASTIC BAGS SUPPLIER

Yih-Chen Yang, Taipei, Taiwan, assignor to Chiang Keh-Yeu, Taipei, Taiwan

Filed Mar. 12, 1980, Ser. No. 129,576

Int. Cl.³ B65D *25/10, 25/16;* B65F *1/06, 1/08*

U.S. Cl. 220—407 **1 Claim**



1. A garbage can with a packaged and folded plastic bags supplier, comprising:

a series of packaged and folded plastic bags stored in a package box, the said package box having a slot through which the said series of packaged and folded plastic bags can be pulled up;

a base composed of an upper plate and a base frame, said upper plate having a slot which is the same as the slot on said package box in length, said base frame comprising two L-shaped legs, each having an upright portion with a top end and a flat base portion, each top end being affixed to said upper plate and each flat base portion facing each other defining a space and support for holding said package box and assuring that said packaged and folded plastic bags can be pulled out smoothly through said slots on said upper plate and said package box;

a can body having suitable height and providing a space on its lower portion to hold said base, said base frame being completely isolated from the upper space of said can body by said upper plate.

4,349,124

COMPOSITE PAPERBOARD TRAY

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 22, 1980, Ser. No. 189,099

Int. Cl.³ B65D *1/42, 5/56, 6/38, 8/12*

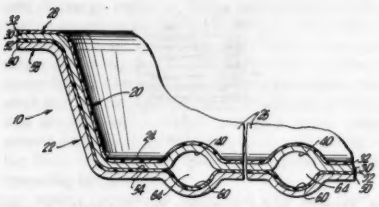
U.S. Cl. 220—453 **7 Claims**

1. A composite tray comprising:

a top tray member press formed from paperboard material having a polymer coating on one side, said top tray mem-

ber including a base surface, a continuous upstanding outwardly tapering side wall extending from said base surface, and a continuous peripheral flange extending outwardly from said side wall substantially parallel to said base surface, said top tray further including a plurality of elongated embossments formed on the base surface thereof and projecting toward the plane of said peripheral flange, said paperboard material being oriented such that said polymer coating is disposed on the convex side of said embossments; and

a bottom tray member press formed from paperboard material having a polymer coating on one side, said bottom



tray member having a configuration substantially identical to the configuration of said top tray member but having slightly larger dimensions than said top tray member and having a plurality of elongated debossments formed on the base surface thereof and projecting away from the plane of the peripheral flange, said top tray member being disposed within said bottom tray member and fixedly connected thereto along the peripheral flanges, the side walls and the portions of the base surfaces between the bossments such that said bossments cooperate with the opposing base surface to define elongated enclosed portions that increase the structural rigidity of the composite tray.

4,349,125

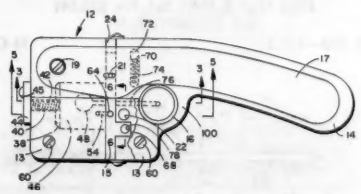
SLIDING DENTAL AMALGAM DISPENSER

Maurice M. Weikel, Las Vegas, Nev.

Continuation-in-part of Ser. No. 190,627, Sep. 25, 1980, which is a continuation-in-part of Ser. No. 951,079, Oct. 13, 1978, abandoned. This application Dec. 31, 1980, Ser. No. 221,807

Int. Cl.[3] **G01F** *11/22, 11/24;* **A47F** *1/035;* **B65D** *83/04*

U.S. Cl. 221—96 **19 Claims**



1. A dental amalgam dispenser comprising:

a mercury reservoir;

a material distribution shell receiving said mercury reservoir and defining a dispensing well extending therethrough, a linear track laterally displaced from said dispensing well, a transfer inlet in said linear track, a channel for conducting mercury from said mercury reservoir to a transfer inlet in said linear track, a transfer outlet located in said linear track and longitudinally displaced from and vertically no higher than the level of said transfer inlet, and a channel for conducting mercury from said transfer outlet to said dispensing well;

a transport carriage coupled to said shell for reciprocal movement along said track and including a tablet tray for carrying silver tablets to said dispensing well for discharge therein and wherein there is defined in said carriage a measuring chamber, and said carriage is reciprocal in sliding sealed engagement with said track to a position in which said measuring chamber is in communication with said transfer inlet and alternatively to a position in which said measuring chamber is in communication with said transfer outlet; and

a handle connected to one of said shell and said carriage, and a trigger connected to the other thereof at a sliding connection and to said one thereof at a fulcrum, and spring means biasing said handle and trigger apart, whereby squeezing said handle and said trigger together brings said measuring chamber from communication with said transfer inlet to communication with said transfer outlet.

4,349,126

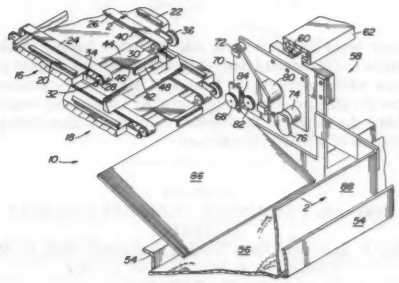
SUBSTRATE DISPENSING APPARATUS

William L. Brown, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Nov. 21, 1980, Ser. No. 209,244

Int. Cl.[3] **B65G** *59/00*

U.S. Cl. 221—112 **9 Claims**



1. Apparatus for dispensing substrates comprising at least one horizontally disposed shelf, means supporting said shelf, means dividing the shelf into a plurality of lanes, each such lane having means including at least one endless belt for moving a stack of upright substrates thereabove and in contact therewith toward a front edge of the shelf, a shaft adjacent the front edge of the shelf, a roller on the shaft and around which the belt extends, drive means connected to the shaft for rotatably driving the shaft which in turn moves said belt to cause substrates in contact therewith to move toward the front edge of the shelf, a motor means for selectively driving said drive means, a transfer member for each lane, each transfer member being supported by the front end portion of the shelf, each transfer member projecting beyond the effective reach of its associated belt so that the leading substrate to be dispensed is supported by said transfer member prior to dropping downwardly off a free end of said transfer member when pushed by the next succeeding substrate.

4,349,127

DEVICE FOR AFFIXING GARMENTS ONTO HANGERS

Hassel J. Savard, Jr., Neshanic, N.J., assignor to Atron, Inc., Rahway, N.J.

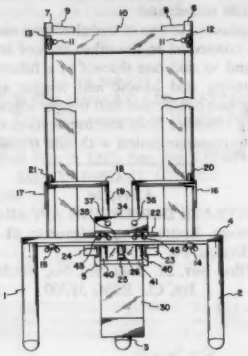
Filed Sep. 11, 1979, Ser. No. 74,324

Int. Cl.[3] **B65H** *3/00;* **B65G** *59/00*

U.S. Cl. 221—196 **13 Claims**

1. A device for holding a stack of hangers and for advancing one hanger at a time from said stack to a forward delivery position and for affixing a garment onto the hanger when in the forward hanger delivery position, which comprises a frame for holding said hangers, a main plate essentially perpendicular to said frame intersecting said frame in an essentially cross config-

uration, a slide for said hanger resting on said main plate, said slide being slidable from said forward hanger delivery position to a rearward hanger receiving position and vice versa and the device further comprises means for holding said stack of hangers on said frame and for releasing one hanger at a time from said stack and causing said hanger to be seated in said slide, said



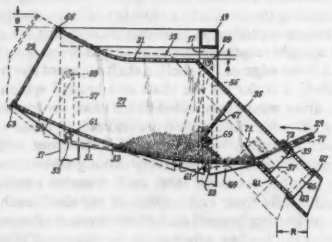
hanger being movable from said rearward hanger receiving position to the forward delivery position along a support guide means which supports the hanger at the delivery position to allow the affixing of a garment onto the hanger, and means for holding the hanger at the forward delivery position during the operation of affixing the garment.

4,349,128

MOVABLY MOUNTED DISPENSER FOR BULK MATERIAL

Jasper B. Sanfilippo, Plum Tree Rd., Barrington Hills, Ill. 60010

Filed Jun. 9, 1980, Ser. No. 157,792
Int. Cl.³ B67D *5/64*
U.S. Cl. 222—166 **7 Claims**



7. A movably mounted dispenser for a bulk product, comprising:

a container having front and rear ends;

a rack having spaced vertical supports mounting said container;

an outlet opening adjacent the lower edge of the front end of said container;

a spout adjacent said outlet formed by lower portions of said container creating a narrowing of the container adjacent the opening; and

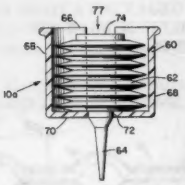
two pairs of elongated members pivotally mounted at one of their ends to said spaced vertical supports and at the other of their ends to opposing sides of said container adjacent the respective members, all members being parallel when said container is at rest, one pair of said elongated members being located adjacent the front end of said container and the other of said pairs being located adjacent the rear end of said container, the pair of said elongated members at the rear end of said container being shorter than the pair at the front end.

4,349,129

PORTABLE, MEASURED VOLUME DISPENSER

John S. Amneus, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 3, 1979, Ser. No. 99,243
Int. Cl.³ B67D *5/06*
U.S. Cl. 222—41 **1 Claim**



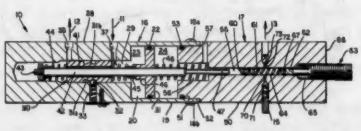
1. A portable liquid dispenser for dispensing a measured volume of liquid, said dispenser comprising: a reciprocatable pump tube affixed to a bottle containing the liquid and adapted to pump the liquid through the tube interior and its upper end when reciprocated; a liquid applicator, said applicator being mountable on said pump tube but being freely removable therefrom, said applicator having a squeezable bellows for holding said measured volume of liquid to be dispensed, said bellows having a common inlet/outlet tube shaped to conform to the end of said pump tube, said inlet/outlet tube being capable of free sliding telescopic connection and disconnection with said pump tube; said bellows being surrounded by a cup-like frame having an open top, a cylindrical lateral periphery, and a flat base, said inlet/outlet tube passing through an opening in said base, said frame being transparent and having indicia marked on the exterior of said lateral periphery to measure the expansion of said bellows, said frame having a thumb-sized slot extending from said open top to said base of the frame.

4,349,130

LIQUID METERING PUMP

Scott S. Bair, Atlanta, Ga., assignor to Woolfolk Chemical Works, Inc., Fort Valley, Ga.

Filed Mar. 3, 1980, Ser. No. 126,541
Int. Cl.³ B67D *5/56*
U.S. Cl. 222—129.2 **14 Claims**



1. Positive displacement metering pump apparatus, comprising in combination:

a housing defining a hollow operating chamber for receiving a fluid motor piston, and a hollow discharge region;

means defining a fluid motor piston reciprocably disposed within said operating chamber;

a fluid inlet port receiving operating fluid for admission to said operating chamber to exert force on said fluid motor piston;

a fluid outlet port receiving operating fluid exhausted from said discharge region;

valve means disposed in said housing and movable indepen-

dently of movement of said fluid motor piston to occupy either a first position or a second position;

said valve means defining a fluid channel connecting said operating chamber and said discharge region;

said valve means in said first position operative to admit said operating fluid to said operating chamber from said fluid inlet port;

said valve means in said second position operative to admit said operating fluid from said discharge region to said fluid outlet port so that the operating fluid previously admitted to the operating chamber can exit the fluid outlet port through said fluid channel and said discharge region; said fluid channel connecting said operating chamber and said discharge region in fluid communication at all times;

actuating means operative to move said valve means from said first position to said second position when said fluid motor piston has moved a first extent in response to said operating fluid entering said operating chamber, and operative to return said valve means to said first position from said second position when said fluid motor piston has moved a second extent in response to said exiting operating fluid, whereby said fluid motor piston undergoes an operating cycle; and

pump means operatively associated with said fluid motor piston to pump a certain amount of working fluid in response to each operating cycle of said fluid motor piston.

4,349,131

APPARATUS FOR DOSING AND FORMING SOAP FOAM

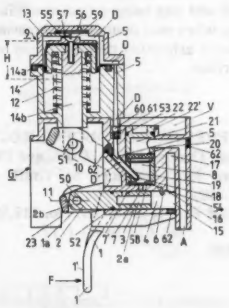
Sandro Arabian, Vaduz, Liechtenstein, assignor to Europtool Trust, Vaduz, Liechtenstein

Filed Apr. 21, 1980, Ser. No. 142,003

Claims priority, application Switzerland, May 10, 1979, 4367/79

Int. Cl.³ B67D *5/42, 5/62*

U.S. Cl. 222—135 **25 Claims**



1. An apparatus for forming lather comprising:

a liquid soap-dosing means;

an actuation lever for actuating said liquid soap-dosing means;

means provided for said liquid soap-dosing means for providing a source of pressurized fluid medium;

means defining a mixing chamber;

means communicating said source of pressurized fluid medium with said mixing chamber;

at least one supply container for liquid soap;

said liquid soap-dosing means comprising a liquid soap-dosing pump;

said liquid soap-dosing pump containing a cylinder compartment and a piston arranged within said cylinder compartment;

said actuation lever simultaneously serving for driving the piston arranged in said cylinder compartment of said liquid soap-dosing pump and for the compression and infeed of the pressurized fluid medium;

infeed means for the infeed of the liquid soap to the cylinder compartment;

means defining a connection opening between the cylinder compartment and the mixing chamber; and

said piston being structured as a slide element for closing and opening said infeed means and for closing and opening said connection opening between said cylinder compartment and said mixing chamber.

4,349,132

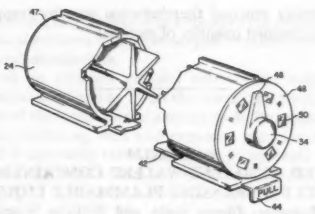
DEVELOPER DISPENSING APPARATUS

Paul J. Macaluso, Norwalk, and James E. Genthe, Newtown, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 101,332, Dec. 6, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 276,308

Int. Cl.³ B67D *5/38*

U.S. Cl. 222—156 **4 Claims**



1. A development powder dispensing apparatus for supplying powder to the sump of a magnetic brush unit comprising:

a generally longitudinal, cylindrical housing having an opening therein, a spider received within said housing, spider having arms that separate the housing into individual chambers in cooperation with the walls of said housing, each of said chambers being of substantially equal volume, means for rotating said spider, means for attaching said dispensing apparatus to the sump of the magnetic brush unit with said opening forming a confluent relationship with said sump when so attached, said housing forming a closed structure after being attached to said sump and means for determining the presence of development powder in said chambers.

4,349,133

DISPENSER AND REFILL PACKAGE

William C. Christine, 341 St. John St., Catasauqua, Pa. 18032

Filed Sep. 12, 1979, Ser. No. 74,736

Int. Cl.³ G01F *11/02*

U.S. Cl. 222—183 **7 Claims**

1. A dispenser for dispensing a predetermined metered quantity of fluidic material, said dispenser comprising:

housing means;

means, removably mounted in said housing means, for holding said fluidic material;

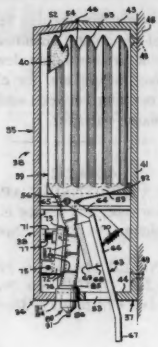
cover means attached to said housing means for covering said holding means when the latter is in said housing means;

peristaltic-acting tube means depending from said holding means including valve means operatively connected thereto;

first lever means pivoted to said housing means for compressing said tube means;

second lever means biased away from said cover means for engaging said tube means when said first lever means compresses said tube means;

said first and second lever means moving in the same direction when said tube means is compressed, so that said tube



is initially pinched therebetween thereby trapping said predetermined quantity of material.

4,349,134

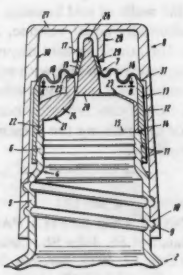
VALVED, RESILIENT-WALLED CONTAINER FOR SAFELY DISPENSING FLAMMABLE LIQUIDS

Wilhelm Schuster; Jürgen Stahl, and Wilhelm Wegner, all of Frankfurt, Fed. Rep. of Germany, assignors to AHK Alkohol Handelskontor GmbH, Fed. Rep. of Germany

Filed Sep. 9, 1980, Ser. No. 185,487

Int. Cl.³ B65D *1/32, 47/06*

U.S. Cl. 222—212 **7 Claims**



1. A container particularly for dispensing a highly flammable liquid, comprising flexible compressible container walls, a safety closure means and a removably attached cap, whereby the safety closure is a membrane controlled cone valve operable by reduction of the interior space of the container, the membrane having a central hole bounded by a sealing edge, through which a valve cone, against which the sealing edge abuts, is engaged, and being constructed with undulations extending concentrically around the central hole, the valve cone is arranged as a hub of an annular plate resiliently yielding in the axial direction and provided with holes formed by radial stays connected to an upper marginal edge of cylindrical moulding, which is inserted as a press fit into a membrane support beneath the membrane, wherein the central hole of the membrane is bounded by an upwardly projecting sleeve conically abutting the valve cone and constituting the sealing edge.

4,349,135

AEROSOL CONTAINER VALVE MOUNTING

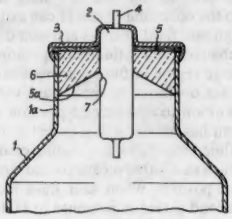
Jean-Claude G. Busselet, Le Neubourg, France, assignor to Etablissements Valois, Le Neubourg, France

Filed Mar. 3, 1980, Ser. No. 126,757

Claims priority, application France, Mar. 8, 1979, 79 05937

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—394 **2 Claims**



1. A hand actuated aerosol spraying device comprising; a container with a neck at one end and an aperture at the same end, a valve disposed in the neck with an outlet tube projecting outside the container, a cap closing the container and holding the valve in position inside the neck, said cap being provided with an orifice for the outlet tube, a sealing gasket being disposed between the cap and the container for preventing fluid leakage, wherein there is provided in the container neck between the valve and the inner wall of the container neck a ring made of a material insensitive to the product stored in the container, said ring forming an impervious bar between the valve and the container inner wall so as to prevent the stored product from reaching the gasket, wherein said gasket is a flat washer, and said ring bears against said cap through said gasket, and wherein the axial surface of the ring, opposite to the cap, is of a generally conical form, the axial length of the ring being shorter toward the container axis, and the inner circumferential edge of said ring being adjacent a filling orifice in the valve, whereby, when said container is inverted, said product may be completely exhausted therefrom, via said conical surface and said orifice.

4,349,136

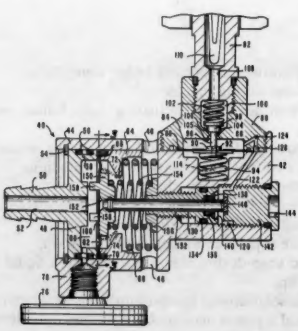
SAFETY PRESSURE REDUCING REGULATOR

Merton R. Fallon, Thousand Oaks, Calif., and Thomas W. Clements, Ambler, Pa., assignors to Draft Systems, Inc., Northridge, Calif.

Filed Feb. 7, 1980, Ser. No. 119,561

Int. Cl.³ B67D *1/12*

U.S. Cl. 222—396 **35 Claims**



26. A pressure regulator for disposition between a gas pressure source and a pressure vessel, comprising:

a housing provided with a pressure chamber therein and one or more vents to release excess pressure from said pressure chamber;

inlet means for supplying pressurized gas from said gas pressure source to said pressure chamber;

outlet means in communication with said pressure chamber for supplying the pressurized gas to said pressure vessel;

a flexible diaphragm disposed within said housing for normally sealing said pressure chamber from communication with said vents; and

clamping means disposed within said housing and adapted to normally clamp said diaphragm across said pressure chamber to block communication with said vents, said clamping means being actuatable in response to excess pressure in said pressure chamber to unclamp said diaphragm and allow said diaphragm to collapse and permit gas to escape from said pressure chamber through said vents, said clamping means including a piston slidably mounted within said housing and adapted to engage the periphery of said flexible diaphragm, said piston including a central passage to provide communication between said pressure chamber and said vents, and said flexible diaphragm being normally disposed across said central passage to block communication between said pressure chamber and said vents with the periphery thereof being collapsible into said central passage when unclamped by said piston.

4,349,137

GARMENT PRESSING MACHINES

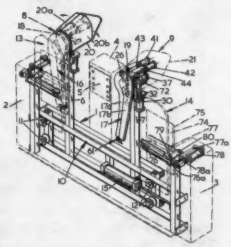
Nicholas W. Everett, Close House, Hardraw near Hawes, Yorkshire, England, assignor to Richard Sussman and Wynne Everett, both of, Englewood Cliffs, N.J.

Filed Aug. 14, 1980, Ser. No. 178,152

Claims priority, application United Kingdom, Jan. 25, 1980, 8002524

Int. Cl.³ D06C *15/00*; D06F *71/34*

U.S. Cl. 223—73 **39 Claims**



1. A garment pressing machine comprising a sleeve form for insertion into the sleeve of a garment to be pressed and a nipping member for pressing the associated arm hole region of said sleeve upon relative movement of the sleeve form and the nipping member into pressing relationship, said form and said member each comprising two sections flanking a wedge element which is position adjustable to move the half sections relative to each other and hence vary the overall size of said form or member.

4,349,138

CARRYING RACK FOR MOTORCYCLES

Andrew C. Bruhn, P.O. Box 594, Springfield, Oreg. 97477

Filed Oct. 19, 1981, Ser. No. 312,693

Int. Cl.³ B62J *7/04*

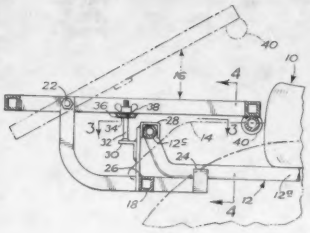
U.S. Cl. 224—30 R **5 Claims**

1. A carrying rack for motorcycles of the type having a rear frame including spaced longitudinal portions and a horizontal connecting portion between the longitudinal portions, said rack comprising

(a) a mounting bracket,

(b) a top platform supported horizontally on said mounting bracket for holding a load,

(c) extension means on said mounting bracket arranged to abut up against each of the longitudinal portions of a rear frame of a motorcycle and including pairs of upwardly



extending fingers arranged to receive the respective longitudinal portions of the motorcycle frame therebetween for lateral stabilization,

(d) and an inverted channel member on said mounting bracket arranged to fit on the horizontal connecting portion of the rear frame of a motorcycle for vertical support, thus combining with said extension means of the bracket and its upwardly extending fingers to hold said rack on the frame of a motorcycle.

4,349,139

HANG STRAP FOR PORTABLE INSTRUMENT

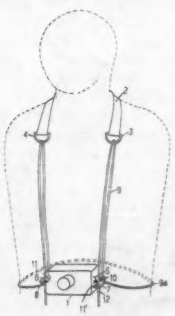
Akira Oishi, 16-18 Isoyama 2-Chome, Suzuka-Shi, Mie-Ken, Japan

Filed Mar. 25, 1981, Ser. No. 247,255

Claims priority, application Japan, Aug. 7, 1980, 55/112158[U]

Int. Cl.³ A45F *5/00*

U.S. Cl. 224—257 **6 Claims**



1. A hang strap for a portable instrument comprising: a neck hang band with first and second hang rings; first and second stopping means connected to the portable instrument; and a string; one end of said string being fixed relative to said first stopping means and the other end of said string being movably passed through said first hang ring and back through a string-passing hole of said first stopping means and thence through a string-passing hole of said second stopping means and said second hang ring, and after that being fixed relative to said second stopping means; and said string having a torso portion, which extends between said string-passing hole of said first stopping means and said string-passing hole of said second

stopping means, and being circled around the user's torso in use.

4,349,140

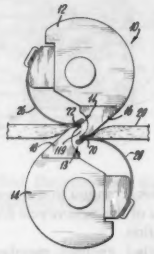
APPARATUS FOR PARTITIONING AND SHAPING A FIBROUS BATT

Anthony Passafiume, Burbank, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 51,562, Jun. 25, 1979, Pat. No. 4,279,369. This application Sep. 26, 1980, Ser. No. 191,638

Int. Cl.³ B26F *3/02*

U.S. Cl. 225—97 **13 Claims**



1. Apparatus for partitioning a batt of loosely compacted short fibers comprising: a pair of rolls disposed adjacent each other with their axes parallel, said rolls each having at least one jaw member affixed to the roll and extending along the surface of the roll parallel to the roll axis a distance at least equal to the width of the batt being partitioned; each jaw member comprising a non-resilient means and a resilient means disposed adjacent each other, said non-resilient means being constructed with the furthest tip of said means projecting outwardly from the surface of the roll at least about 0.1 inch; the non-resilient means having a first face forming said furthest tip, said first face disposed substantially perpendicular to a plane in which the axis of the roll lies, a second curved face forming an initial angle of 90° or less with said first face at one end thereof and curving inwardly under said first face and extending at least to the surface of the roll, and a third face extending from the opposite end of said first face to the surface of the roll; the resilient means comprising an arcuate projection, extending from and about the surface of the roll to a first face disposed adjacent said one end of said first face of said non-resilient means and perpendicular to a plane in which the axis of the roll lies, said first face of said resilient means projecting outwardly from the surface of the roll at least about as far as said non-resilient means and extending along the surface of the roll parallel to the roll axis at least as far as said non-resilient means, and means for rotating the rolls in opposite directions so that jaw members on the oppositely rotating rolls engage each other in a manner that the non-resilient means of one roll engages the oppositely rotating resilient means of the other roll with the second face of the non-resilient means of one roll passing the second face of the non-resilient means of the other roll with a clearance between the faces of at least 0.03 inch.

4,349,141

PISTON RETURN FOR POWDER ACTUATED PISTON TOOL

Jean Ollivier, and Yves Bosch, both of Valence, France, assignors to Olin Corporation, New Haven, Conn.

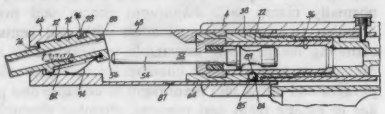
Filed Jun. 12, 1980, Ser. No. 158,952

Int. Cl.³ B25C *1/14, 1/18*

U.S. Cl. 227—10 **7 Claims**

6. In a powder-actuated fastener driving tool of the type having a barrel with a bore, and a piston reciprocally slidably disposed in said barrel bore for movement between a breechward driving position and a muzzleward driven position, a piston return mechanism comprising:

(a) a muzzle bushing having a bore, said muzzle bushing being mounted on a slide movably mounted on said tool for movement between a first breechward position wherein said piston, when in said driven position, extends into said muzzle bushing bore, and a second muzzleward position wherein said muzzle bushing bore is open for receipt of a fastener and clear of said piston when the latter is in said driven position;



(b) piston return means on said slide for engaging a fastener driving face on said piston when said slide is in said second position and said piston is in said driven position whereby return of said slide to said first position causes return of said piston to said driving position; and

(c) means for disengaging said piston return means from said fastener driving face of said piston when slide approaches said first position.

4,349,142

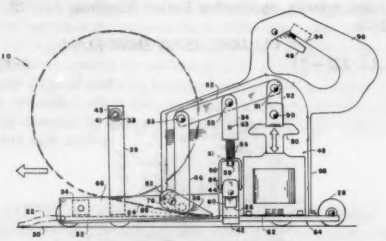
ELECTRIC RUG BINDING SYSTEM

Richard A. Soter, III, 3421 Glen Ave., Baltimore, Md. 21215

Filed Nov. 10, 1980, Ser. No. 205,309

Int. Cl.³ B25C *5/02, 5/15*

U.S. Cl. 227—13 **12 Claims**



1. A portable system for rug binding by fastening a tape at spaced intervals along a top margin of an edge of a rug disposed on a horizontal surface, comprising: a frame, means for manually directing the frame along a said rug edge including means for laterally biasing the system against the rug edge and means for lifting a portion of the rug marginally along the rug edge; means for dispensing the tape along the top margin of the rug edge, means for pressing and stretching the tape downward along said top margin prior to said fastening, a trigger, and means for power driving and affixing a staple through the tape and the top margin upon each actuation of the trigger.

4,349,143

ELECTRIC STAPLER AND DRIVER ASSEMBLY THEREFOR

John F. Ewig, Worcester, Mass., assignor to Parker Manufacturing Co., Worcester, Mass.

Filed May 12, 1980, Ser. No. 148,721

Int. Cl.³ B25C *5/15*

U.S. Cl. 227—131 **7 Claims**

1. An electric stapler comprising:

(a) a housing having a main body, a magazine portion, and a handle, said magazine portion having a flat bottom surface

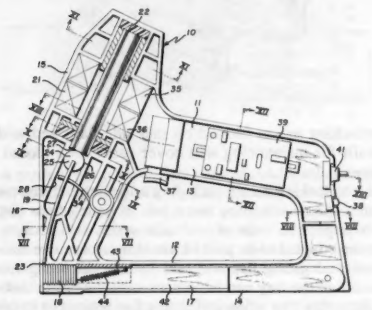
which is the bottom surface of said stapler and is adapted to lie along the surface of an article to be stapled, said main body extending from one end of said magazine portion and having an end surface lying substantially at a right angle to said bottom surface, said end surface being the forward most surface of said stapler,

(b) a staple magazine located in said magazine portion to present staples seriatim to said one end,

(c) a staple driver mounted in said main body for sliding motion toward and away from said one end of said magazine portion, and

(d) a solenoid mounted in said main body and having a plunger whose line of reciprocation lies at an acute angle to said end surface, said plunger being in contact with said staple driver,

wherein the staple driver is an elongated metal band, and wherein the main body is formed with a first passage to



guide the staple driver, the first passage being curved, so that a portion adjacent the said one end of the magazine portion would have an imaginary tangent that is parallel to the said end surface of the main body and so that the remainder curves away from the said end surface, said contact between said plunger and said stapler driver is such as to permit angular misalignment therebetween, said staple driver flexing as it is driven along said first passage by the reciprocation of said plunger, wherein said staple driver is provided with a nylon head having a cylindrical surface whose axis extends transversely of the length of said driver, and wherein said plunger is formed of nylon and provided with a transverse flat surface for contact with said cylindrical surface of said head, wherein said main body is provided with a second passage of rectangular cross section sized to receive said head in sliding relationship, said second passage being non-coextensive with said first passage.

4,349,144

FRICTION WELDING MACHINE WITH DUAL POSITION END STOP

Christopher T. S. Stevenson, New Britain, and Elio F. D'Aloisio, East Hartford, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.

Filed Feb. 5, 1981, Ser. No. 231,669
Int. Cl.³ B23K *19/02*
U.S. Cl. 228—2 **1 Claim**

1. A friction welding machine comprising

a base including horizontal way surface means, and a plurality of horizontally spaced keyway means,

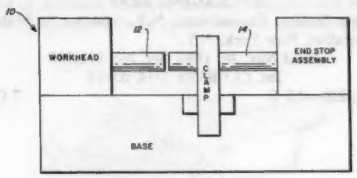
an end stop assembly including

housing means having roller support means for permitting horizontal displacement of said end stop assembly along said way surface means, and

slide means having key means for matingly engaging with said base keyway means and a pair of vertically spaced, horizontally extending, axially spaced end stops,

first means for locating said slide means at a lowermost position for locating the upper end stop at a predetermined machining location,

second means for locating said slide means at an intermediate position for locating the lower end stop at a predetermined machining location, and



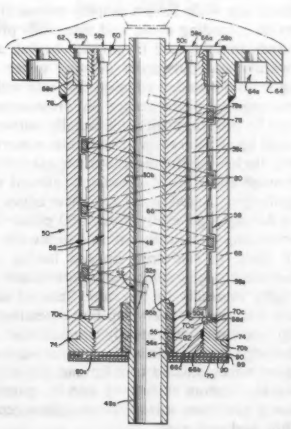
third means for locating said slide means at an uppermost position whereat said slide key means becomes disengaged from said base keyway means whereby said end stop assembly can be horizontally displaced relative to said base.

4,349,145

METHOD FOR BRAZING A SURFACE OF AN AGE HARDENED CHROME COPPER MEMBER

George Shinopulos; M. Ronald Randlett, both of Burlington, and Terry F. Bower, Needham, all of Mass., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 57,411, Jul. 13, 1979, Pat. No. 4,307,770, which is a division of Ser. No. 928,881, Jul. 28, 1978, Pat. No. 4,211,270. This application Dec. 3, 1980, Ser. No. 212,595
Int. Cl.³ B23K *1/04, 1/20*
U.S. Cl. 228—208 **4 Claims**



1. A method for brazing a surface of an age hardened chrome copper member to a surface of a stainless steel member comprising the steps of

plating said surfaces with copper,

applying a braze material of a copper/gold alloy between said surfaces,

applying a brazing paste of said copper/gold alloy between said surfaces,

urging said surfaces toward one another, said brazing material and said braze paste,

heating said alloys to a temperature below the fusing point of said braze material in a protected atmosphere,

rapidly heating said materials to fuse said braze material in a protected atmosphere, and

cooling said materials in a protected atmosphere after said rapid heating.

4,349,146

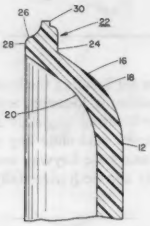
PACKAGING TRAY

M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 28, 1980, Ser. No. 211,005

Int. Cl.³ B65D *1/34, 65/16*

U.S. Cl. 229—2.5 R **7 Claims**



1. In a molded tray for the packaging of meat, fish, poultry, comestibles or the like in conjunction with a transparent overwrap film extending thereabout, said tray comprising upwardly and outwardly inclined side walls forming the sides of said tray; bottom wall means including a substantially flat bottom wall for supporting said meat, fish, poultry, comestibles or the like; and a large-radius curved wall portion extending between said bottom wall and the lower ends of said side walls so as to provide a smoothly contoured transitional surface, the improvement wherein:

said inclined side walls have a radially outwardly extending lip portion extending about said side walls proximate the upper ends thereof, said lip portion having a concavely downwardly and outwardly curving upper surface extending from a rounded edge on said side walls, a generally rectangular protuberance in cross-section smaller than said lip portion projecting radially outwardly of and about said lip portion so as to constitute a narrow trim lip, said trim lip having the upper surface extending from the lower outer end of said concavely curved surface and having sharp-cornered upper and lower edges, and said lip portion having a generally horizontal planar bottom surface extending outwardly of said sidewalls below the bottom plane of said trim lip and having a convexly rounded outer edge joining the bottom plane of said trim lip radially inwardly of the outer face of said trim lip whereby transparent overwrap film extending about said tray lip portion will primarily contact and engage the rounded edge on said side walls, the sharp-cornered upper and lower edges on said trim lip and the rounded outer edge on the bottom surface of said lip portion so as to maintain a minimum surface contact between said overwrap film and said tray.

4,349,147

TRAY WITH INTEGRAL LOCKING TAB

James R. Jensen, Fremont, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 19, 1981, Ser. No. 245,055

Int. Cl.³ B65D *5/22*

U.S. Cl. 229—34 R **2 Claims**

1. A tray formed of a unitary blank of foldable paperboard for storing food articles such as mushrooms and the like, said tray comprising:

a bottom wall;

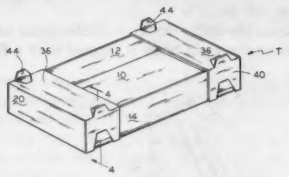
a pair of opposed side walls foldably joined to and upstanding from opposed side edges of said bottom wall;

a pair of opposed end walls foldably joined to and upstanding from opposed end edges of said bottom wall;

a pair of corner flaps foldably joined to opposed ends of said pair of opposed side walls and being turned inwardly to lie adjacent to the inside surfaces of respective end walls;

top cover panels foldably joined to upper edges of respective end walls and folded inwardly and downwardly to close at least a portion of the tray;

side flaps connected to opposed ends of said top cover panels and folded downwardly in face-to-face relation with the outer surfaces of said side walls;



interlocking means formed on said side flaps and said side walls for maintaining said cover panels in a closed position; and

said interlocking means including a locking tab disposed on each of said side flaps and a pair of gating flaps disposed on respective ends of said side walls, said locking tabs being adapted to be pushed inwardly so as to be deflected past said gating flap and said locking tab being retained inside of the tray and in contact with the inside surface of said gating flap when said gating flap returns to its original position.

4,349,148

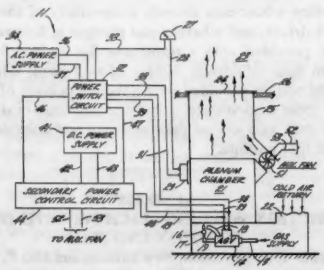
EMERGENCY HEATING SYSTEM CONTROL CIRCUIT

Samuel J. Liberto, 429 Parker St., and James Meli, 6981 Verona St., both of Verona, Pa. 15147

Filed Feb. 23, 1981, Ser. No. 236,797

Int. Cl.³ H02J *7/00;* **F24D** *5/10*

U.S. Cl. 236—11 **7 Claims**



1. A DC power emergency heating system control circuit for use in combination with a gas furnace that includes an AC power supply for a thermostat to control a normally operated AC powered automatic gas valve, which gas valve provides gas for burning in a plenum chamber, said control circuit including an auxiliary fan and means responsive to the interruption of AC power to provide in a repetitive sequence DC power of one polarity to said automatic gas valve, followed by energization of said auxiliary fan, followed by DC power of opposite polarity to said automatic gas valve, said repetitive sequence thereby ensuring alternate periods of convection and

auxiliary fan induced forced air heating while simultaneously protecting said AC powered automatic gas valve from the deleterious effect of emergency DC powered operation of said normally operated AC powered gas valve.

4,349,149

MIXING VALVE

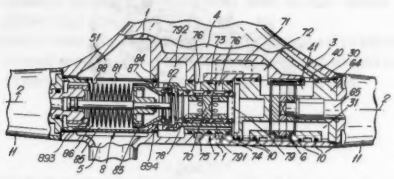
Jürgen Humpert, Hemer, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,381

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928330

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—12 R **6 Claims**



1. A mixing valve for mixing hot and cold water comprising:

a valve body having a first passage in communication with a hot water sources, a second passage in communication with a cold water source, a central core positioned transverse to at least one of said first and second passages;

a synchronously acting volume control device positioned in said bore; and

at least one mixture control device for controlling the mixture of said hot and cold water positioned downstream of said volume control device,

said volume control device comprising a cylindrical cartridge adapted to be inserted into said bore, said cartridge containing:

an inlet disc having a pair of diametrically opposing holes,

an outlet disc having a pair of diametrically opposing holes each of which is in alignment with a corresponding one of said holes of said inlet disc,

said inlet and outlet discs being mounted in said cartridge transverse to the axis of said cartridge and so as to prevent rotational movement,

third and fourth flow passages each in respective communication between one of said first and second passages and one of said inlet disc pair of holes,

and a control disc rotatably mounted intermediate said inlet and outlet discs and having a pair of diagonally disposed control ports;

said control disc being rotatable to place said pair of control ports in fluid communication between said inlet and outlet disc pairs of holes;

said valve comprising a spindle coaxial to said axis and coupled to said control disc for rotational movement thereof.

4,349,150

CONCRETE SLEEPER WITH THE FASTENING HOUSING

Marius H. Lubbers, Wassenaar, Netherlands, assignor to Everts & Van der Weyden Exploitatiemaatschappij, The Hague, Netherlands

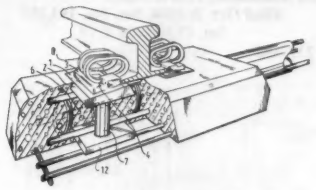
Filed Apr. 23, 1980, Ser. No. 142,980

Claims priority, application Netherlands, May 7, 1979, 7903569

Int. Cl.³ E01B *2/00, 9/00, 9/40*

U.S. Cl. 238—265 **8 Claims**

1. In a railway sleeper assembly which comprises a concrete sleeper having longitudinally extending metallic reinforcing rods and a pair of fastening housings adjacent the opposite ends of the sleepers for supporting rails in spaced apart, anchored conditions, the improvement wherein each fastening housing comprises a carrier plate portion partially embedded in the concrete and presenting an exposed upper surface supporting a respective rail and having recesses receiving rail clamps to secure the respective rail in place, said fastening housing being formed of synthetic resinous material whereby said rails are electrically insulated from each other, the synthetic resinous



material of the fastening housing reacting under stress not only to support the rail and any load thereon but also to anchor the rail clamp, vertically extending anchoring means integral with and depending from carrier plate portion within the concrete for maintaining said fastening housing in fixed relation to said sleeper, and means cooperating with said anchoring means and with said reinforcing rods to enhance the fixation of said fastening housings to the sleeper and to tie the opposite ends of said sleeper to each other.

4,349,151

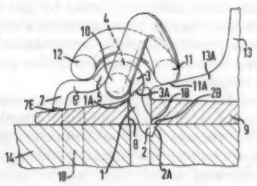
HOLDING A RAILWAY RAIL DOWN ON A SUPPORT MEMBER

Jon S. Schumaker, Mantua, N.J., assignor to Pandrol Limited, London, England

Filed May 21, 1980, Ser. No. 152,100

Int. Cl.³ E01B *9/34*

U.S. Cl. 238—349 **10 Claims**



1. A device for use in holding a railway rail down on a support member, said device comprising a first part for lying in a vertical hole through the support member and a second part at the bottom of the first part, the second part comprising a projection which extends sideways and a part of which is to lie vertically below a part of the support member which is beside the bottom of said hole, said device further comprising a third part at the top of the first part and extending upwardly therefrom, a fourth part extending sideways from the top of the third part, and then a fifth part extending downwardly, the first part comprising a convex portion so that when the first part is driven downwardly into said hole the convex portion makes contact with the wall of said hole and forms therewith a pivot about which said device turns to cause said part of said projection to come vertically below said part of the support member, the third, fourth and fifth parts forming an arch under which a first portion of a rail-fastening clip can be driven, which portion will press upwardly on the fourth path of said device, said device further comprising a sixth part extending sideways from the lowest extremity of the fifth part, the sixth part being for receiving a downwardly pressing portion of the clip, and a

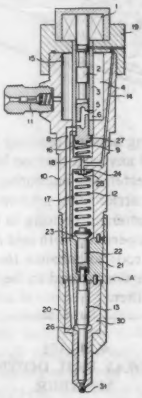
seventh part extending downwardly, on the same side of the arch as the fifth part, for holding the sixth part above and spaced from the support member, the lowest portion of the seventh part being higher than the lowest portion of the second part.

4,349,152

ACCUMULATOR TYPE FUEL INJECTION APPARATUS

Jiro Akagi, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 193,384
Int. Cl.³ F02M *4/16*
U.S. Cl. 239—96 **2 Claims**



1. A fuel injection apparatus including a fuel injection pump operatively connected therewith, comprising:

a holder body having an accumulator chamber and a spring chamber formed therein at an upper end portion and a lower end portion thereof, respectively;

a nozzle body detachably connected to said holder body, said nozzle body having formed therein a stepped longitudinal bore, a pressure chamber intermediate said stepped longitudinal bore and an injection orifice communicating with said longitudinal bore;

a check valve disposed in a passage communicating said fuel injection pump with said accumulator chamber for allowing the fuel passage from said injection pump to said accumulator chamber but blocking the opposite way;

a solenoid-operated spool valve means mounted in said accumulator chamber, said spool valve means comprising a cylindrical member having an inlet port and an outlet port formed therein and a spool movable in said cylindrical member;

a communication passage formed in said holder and valve bodies, said communication passage having an upper end selectively connectible with said accumulator chamber through said spool valve means and a lower end in constant communication with said pressure chamber;

a needle valve fitted in said stepped longitudinal bore and movable therein in response to fluid pressure developed in said pressure chamber;

a first spring means accommodated in said spring chamber for biasing said needle valve toward closing said injection orifice;

a second spring means for biasing said spool toward a first spool position where communication between said accumulator chamber and said communication passage is blocked; and

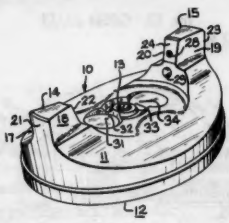
means formed in said spool for normally blocking communication between said accumulator chamber and said communication passage when said spool is upwardly displaced to the first spool position by said second spring means but allowing communication therebetween when said spool is downwardly displaced to a second spool position by the actuation of said solenoid-operated spool valve means.

4,349,153

SPRAY NOZZLE

Michael F. Johnson, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jul. 29, 1980, Ser. No. 173,412
Int. Cl.³ B05B *1/26, 1/28*
U.S. Cl. 239—105 **5 Claims**



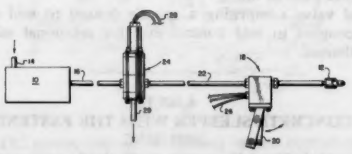
1. A spray nozzle for spraying apparatus using air for atomization, said nozzle having a center orifice for the discharge of a stream of material and air, a pair of horns on opposed sides of such center orifice and extending outwardly therefrom, a plurality of atomizing openings adjacent said center orifice for aiding in the atomization of such material, a plurality of openings aligned with said horns for discharging air to engage and shape said material and air mixture into a desired spray pattern, at least one of said openings being located in each of said horns, each of said horns defining a pair of air ramps extending from the outer surface of each of said horns to the inner surface of said horn, the bottom surface of each of said air ramps extending from said outer surface of said horn to said inner surface of said horn, said bottom surface of each of said air ramps being generally parallel to the main surface of said nozzle, said air ramps on the opposite sides of each of said horns converging toward one another as they approach such inner surface, whereby during operation an air flow is induced towards the center orifice to deflect material particles away from the horns.

4,349,154

POWER ASSISTED DUMP VALVE

Amos Pacht, Houston, Tex., assignor to Butterworth, Inc., Houston, Tex.

Filed Nov. 1, 1979, Ser. No. 90,401
Int. Cl.³ B05B *9/00*
U.S. Cl. 239—124 **19 Claims**



1. In a fluid system for supplying a high pressure stream of fluid, including a pump having a low pressure fluid inlet and a high pressure outlet, a valve coupled to said high pressure fluid outlet to control fluid flow, and a nozzle assembly coupled to said valve, an improved dump valve comprising:

a housing having a stepped cylindrical valve chamber having first, second, and third sections, said second section positioned between said first and third sections and having

a diameter smaller than said first section and larger than said third section,

a piston slideably carried within said chamber having first and second portions having diameters corresponding to and carried within said first and second chamber sections respectively, and a third portion, opposite said first portion, having a diameter smaller than said second portion for sealingly engaging said chamber third section,

at least one high pressure fluid port in communication with said chamber second section, and a pressure relief port in communication with said chamber third section,

first and second peripheral seals carried on said piston first and second portions respectively, said second seal positioned above said at least one high pressure fluid port,

control valve means for selectively closing and venting to ambient pressure said chamber first section above said piston first peripheral seal, and

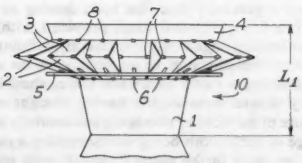
conduit means for conducting fluid from said valve chamber second section below said piston second seal to said valve chamber first section above said piston first seal.

4,349,155

UNFOLDABLE DIVERGENT NOZZLE FOR A ROCKET ENGINE

Paul Donguy, Bruges, France, assignor to Societe Europeene de Propulsion, Paris, France

Filed May 19, 1980, Ser. No. 150,912
Claims priority, application France, May 23, 1979, 79 13208
Int. Cl.³ F02K *1/24*
U.S. Cl. 239—265.33 **3 Claims**



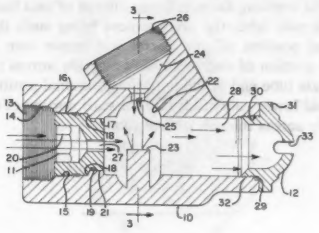
1. An unfoldable divergent nozzle for a rocket engine, having an inner wall and an outer wall and comprising a neck, a fixed upstream portion and a set of elementary individual panels of refractory material articulated to one another and with respect to said fixed upstream portion of said divergent nozzle in the vicinity of said neck of said nozzle, said articulated panels being distributed so as to define at least two successive adjacent rings or frustums and positionable in a first folded position then in a second unfolded position, each said panels having an inner surface for forming a portion of said inner wall of said divergent nozzle, and an outer surface for forming a portion of said outer wall of said divergent nozzle, wherein articulations are provided between two adjacent panels arranged to be folded on one another with their inner surfaces facing one another, each said articulation comprising at least one hinge with two axles inserted in the walls of said two panels articulated to one another, a link being set back with respect to the thickness of said panels and holding said two axles at a constant distance from one another, and wherein two cylindrical surfaces centered respectively on each of said axles and capable of rolling without sliding on one another are arranged on two adjacent panels in the vicinity of said hinge, said two cylindrical surfaces of one articulation centered respectively on each of the axles and rollable without sliding on one another being made of a refractory material and being provided with teeth which are built up on the panels bearing the cylindrical surfaces and are formed of a fusible material.

4,349,156

EFFICIENCY NOZZLE

James Haruch, Clarendon Hills, and Robert Williams, Naperville, both of Ill., assignors to Spraying Systems Company, Wheaton, Ill.

Filed Aug. 11, 1980, Ser. No. 177,087
Int. Cl.³ B05B *7/04*
U.S. Cl. 239—432 **7 Claims**



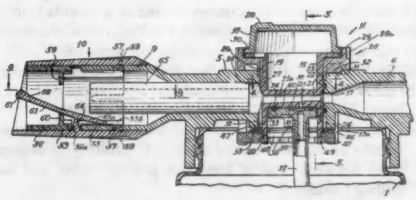
1. A high efficiency nozzle including a nozzle body having a high velocity air inlet opening and a high velocity liquid inlet opening, said air inlet opening directing incoming air axially of the nozzle substantially in a direction straight through the nozzle and said liquid inlet opening directing incoming liquid in a direction substantially at a right angle to the straight through direction of the incoming air, an expansion chamber in the nozzle body, an impingement table defining a flat surface in the expansion chamber, said flat surface disposed in a plane perpendicular to the axis of the liquid inlet opening, said liquid inlet opening including an orifice in alignment with said impingement table, said air inlet opening including an orifice disposed at substantially a right angle to said liquid inlet orifice and generally parallel to the impingement surface of said table, said air inlet opening being disposed at one side of said expansion chamber and a nozzle barrel at the opposite side of said chamber whereby high velocity air is directed across said impingement table to finely atomize liquid particles and the finely atomized liquid particles are carried straight through said nozzle barrel by said high velocity air.

4,349,157

HOSE-END SPRAYER

John L. Beiswenger, Salem, Wis., and Frank A. Smiesko, McHenry, Ill., assignors to Acme Burgess, Inc., Grayslake, Ill.

Filed Jan. 30, 1981, Ser. No. 215,834
Int. Cl.³ B05B *1/26*
U.S. Cl. 239—509 **8 Claims**



1. In a hose-end sprayer comprising a chemical concentrate jar and a top closure having flow control means and a horizontal outlet snout therein and a spray nozzle supported thereby and connected through said snout with said flow control means for the flow of spray solution to said nozzle, the improvements comprising an open ended nozzle tube extending forwardly into said spray nozzle from said snout as an extension thereof, a hollow cylindrical hub extending forwardly

from said snout, the inside diameter of said hub being greater than the outside diameter of said tube, a barrel mounted for rotation upon said hub, an elongated baffle longitudinally arranged within said barrel sidewise of said tube extended and hingedly secured to said barrel at a point intermediate the ends of said baffle, spring means for continuously urging said baffle out of line with said tube, upper and lower transverse cams secured within said barrel forwardly of the location at which said baffle is hingedly secured, said cams having substantially horizontal working faces defining chords of said barrel out of line with said tube, the arrangement being such that at one rotational position of said barrel said upper cam holds the forward portion of said baffle downwardly across the axis of said nozzle tube and at the opposite rotational position of said barrel said lower cam holds said forward portion of said baffle upwardly across the axis of said tube.

4,349,158

PROCESS AND DEVICE FOR WET MILLING OF ROCKS AND THE LIKE

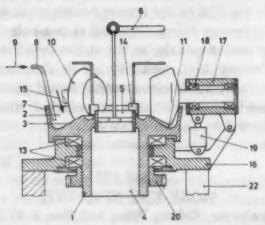
John S. Broman, Bergslagsvägen 12, S-777 00 Smedjebacken, Sweden

Continuation of Ser. No. 33,079, Apr. 25, 1979, abandoned. This application Sep. 4, 1980, Ser. No. 183,795

Claims priority, application Sweden, May 2, 1978, 7805001

Int. Cl.³ B02C *15/00*

U.S. Cl. 241—21 **8 Claims**



1. Process for grading-separating wet milling of rocks and pieces of ore in a mill having a vertical rotatable shaft and a central outlet through said shaft, a milling chamber annularly surrounding said shaft and having a bottom comprising a milling surface inclined radially outwards and downwards from an upper edge of said outlet, at least one milling roller interacting with said milling chamber, comprising the steps of

(a) feeding material to be milled into said milling chamber;

(b) grinding said milling material into a pulp between said at least one milling roller and said milling chamber;

(c) causing insufficiently ground material to slide downwardly along said milling surface to prolong its engagement between said at least one milling roller and said milling chamber;

(d) regulating the volume of said pulp by displacing vertically the position of the upper edge of said central outlet in relation to both the rest of said shaft and said milling surface; and

(e) adjusting the duration of milling to the milling resistance and structure of said material, thereby effecting continued milling of insufficiently milled particles and discharge from said milling chamber through said central outlet of sufficiently milled particles and mineral grains.

4,349,159

SHREDDING MACHINES

John P. Hardwick, 50 Adelaide St., Crewe, Cheshire CW1 3DT; Michael J. Pezet, 17 Woodside Grange, Quorn, Leicestershire, both of England; Asadollah A. Sarvestany, S. Danshgah Ave., Mestah Alley No. '28, Tehran, Iran, and Dayananda Satharasinghe, 204J Block B, Clementi Rd., Singapore, Singapore (5)

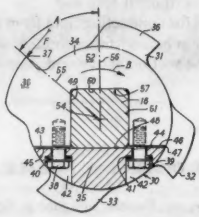
PCT No. PCT/GB79/00111, § 371 Date Mar. 5, 1980, § 102(e) Date Mar. 4, 1980, PCT Pub. No. WO80/00130, PCT Pub. Date Feb. 7, 1980

PCT Filed Jul. 4, 1979, Ser. No. 190,316

Claims priority, application United Kingdom, Jul. 5, 1978, 28953/78

Int. Cl.³ B02C *4/08*

U.S. Cl. 241—236 **4 Claims**



1. A rotary shredding machine of the kind having a comminuting chamber, a pair of parallel cutter shafts arranged for simultaneous contra-rotation in the comminuting chamber, and a plurality of cutters secured to each shaft, the cutters of one shaft being interleaved with those of the other shaft, each cutter being a generally disc-like body having at least one radially projecting peripheral tooth provided with a cutting edge along a leading edge thereof, each body defining a coaxial shaft aperture therethrough to accommodate an associated shaft and defining a cutter axis, each cutter shaft being of a substantially square cross-section having straight sides, each shaft aperture of each cutter also being substantially square, the cutting edge of each tooth being intersected by a radial plane inclined at an angle in the range 0° to 60° with respect to a diametral plane bisecting one side of the corresponding square shaft aperture, said angle being defined forward of the cutting edge in a direction of intended rotation of the cutter, each cutter body including a plurality of cutter body members and releasable fastening means for holding the cutter body members together, at least one of said cutter body members having said tooth, each cutter body member having two first surface portions extending chordally from the periphery of the body member and joined by a second surface portion of the body member for engaging an associated shaft, the said second surface portions of the respective body member together defining the square shaft aperture, and each said first surface portion being juxtaposed with a parallel corresponding first surface portion of the next adjacent body member.

4,349,160

APPARATUS AND METHOD FOR WINDING YARN TO FORM A PACKAGE

Kurt W. Niederer, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Continuation of Ser. No. 78,699, Sep. 25, 1979, abandoned. This application Jul. 30, 1980, Ser. No. 173,482

Int. Cl.³ B65H *54/02, 54/30, 54/38*

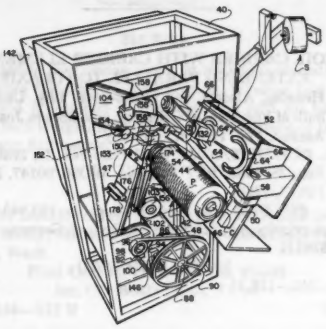
U.S. Cl. 242—18 R **49 Claims**

1. An apparatus for winding yarn from a supply into a yarn package comprising:

(a) spindle means for rotatably supporting a package core for winding thereon yarn delivered thereto from said supply along a yarn feed path to form said yarn package,

(b) yarn traversing means for effecting traversing movement of said yarn along said yarn package, said traversing means including yarn guides movable oppositely along two traversal spans extending longitudinally of said yarn package from respectively opposite yarn engaging locations adjacent the periphery of said package at opposite ends thereof toward respectively opposite yarn disengaging locations adjacent the periphery of said package at the respective other ends thereof, said yarn guides being engagable with said yarn to guide it alternately along said traversal spans from said yarn engaging locations to said yarn disengaging locations, and

(c) movable reversing means adjacent each end of said yarn



package for transferring said yarn from a yarn guide at the yarn disengaging location of one traversal span to a yarn guide at the yarn engaging location of the other traversal span, each said reversing means having yarn engaging means arranged for movement including movement generally transverse to said traversal spans and intersecting said yarn feed path for positively engaging said yarn as a yarn guide guiding said yarn passes through the yarn disengaging location of one traversal span and positively moving said yarn away and out of engagement with said yarn guide and into position for engagement at the yarn engaging location of the other traversal span by a yarn guide moving therethrough for movement along the other traversal span.

4,349,161

THREAD DELIVERY DEVICE WITH IMPROVED THREAD-STORAGE DRUM, PARTICULARLY FOR STICKY YARNS

Eric Carlsson, and Lars Wide, both of Ulricehamn, Sweden, assignors to Aktiebolaget IRO, Ulricehamn, Sweden

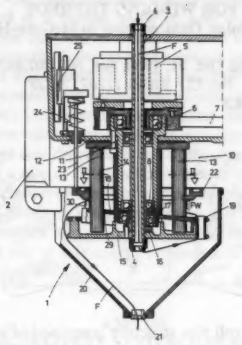
Filed Sep. 27, 1979, Ser. No. 79,615

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842115

Int. Cl.³ B65H *51/22*

U.S. Cl. 242—47.01 **2 Claims**

1. A thread-storage and delivery device for a textile machine, which device includes a storage drum on which a thread is wound tangentially to form a thread storage which consists of a plurality of thread windings wrapped around the drum and from which the thread is withdrawn for supply to the textile machine, the thread drum being of a cagelike structure and formed from a plurality of elongated cylindrical rods which are angularly spaced from one another in a substantially cylindrical pattern about the longitudinal axis of the drum, said plurality of rods defining an outer peripheral surface for said drum on which the thread windings are engaged, the rods being angularly spaced apart so as to define longitudinal peripheral slots therebetween, and a thread-advancing device having portions thereof projecting radially outwardly through said slots for engaging the thread windings to cause the latter to slide axially along said peripheral surface as defined by said rods, comprising the improvement wherein each rod on at least that portion of its exterior surface which defines a part of the drum peripheral surface is provided with a plurality of parallel narrow grooves formed therein and extending axially thereof, which said narrow grooves are separated by narrow axially-extending ribs, the outer free edge of each said rib defining a



narrow axially-elongated surface section which defines a part of the peripheral drum surface and is engaged by the thread windings, said surface section having a width in the circumferential direction of the drum of at least approximately 0.7 mm, and said groove having a width in said circumferential direction which does not significantly exceed the width of said surface section.

4,349,162

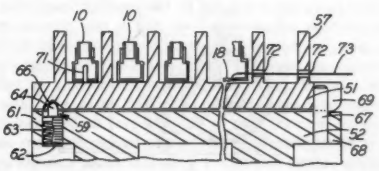
DEVICE FOR RECEIVING AND PACKAGING A STRIP OF ELECTRICAL COMPONENTS

William J. Fanning, Glen Ellyn, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,420

Int. Cl.³ B65H *75/00*

U.S. Cl. 242—54 R **2 Claims**



1. An apparatus for receiving and storing a strip with spaced, projecting pairs of terminals, each pair of which is secured to an electrical device, which comprises:

a drum having a series of bores formed in the peripheral surface in the vicinity of a first end of the drum;

a cylinder slidably mounted on the drum with a series of indentations formed on the inner surface and spaced apart to align with the bores in the drum;

a series of resilient biased pin checks mounted in said bores and having sections projecting into said indentations for releaseably holding said cylinder on said drum;

said cylinder having a series of slots formed to extend inwardly from an edge of the second end of said cylinder;

drive pins mounted in the vicinity of the second end of said drum and extending into said slots formed in said cylinder;

a fin projecting from the outer surface of said cylinder and forming a continuous helix about the axis of said cylinder to form a helical channel for receiving the strip of terminals and electrical devices, said fin being of a height

greater than the height of the strip and the projecting terminals and electrical devices; and

means projecting from said cylinder into the helical channel for anchoring a forward end of said strip to said cylinder.

4,349,163

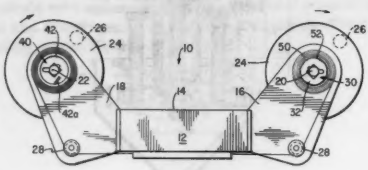
CORELESS ROLL FILM STRUCTURE AND APPARATUS FOR WINDING THEREOF

David S. Wise, Solon, Ohio, assignor to McGraw-Hill, Inc., New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,867

Int. Cl.³ B65H *17/02, 75/28*

U.S. Cl. 242—68.3 **12 Claims**



1. A coreless roll film structure composed of a strip of film having an innermost and outermost end and comprising a fixed, closed loop of predetermined diameter formed at said innermost end.

4,349,164

RETRACTOR PROVIDED WITH TWO TYPES OF EMERGENCY LOCKING MECHANISM AND TAKE-UP FORCE LOCKING MEANS

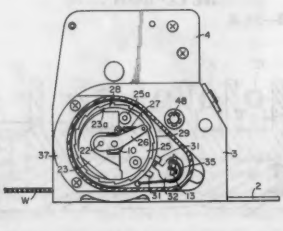
Katsumi Naitoh, Fujisawa, Japan, assignor to NSK-Warner K. K., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,495

Claims priority, application Japan, Oct. 2, 1979, 54-135843

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **3 Claims**



1. A retractor comprising a base member having two opposed side plate portions, reel shaft means rotatably supported between said two opposed side plate portions of said base member, a first gear member fixed to one end of said reel shaft means, a second gear member rotatably supported about a shaft on said side plate portion which is adjacent to said one end of said reel shaft means, said second gear member being meshed with said first gear member and given a webbing take-up force, take-up force locking means for relieving the webbing take-up force applied to webbing during the wearing of a belt, said take-up force locking means being mounted on said side plate portion which is adjacent to said one end of said reel shaft means, sensing means for sensing the wearing of the belt by a user, said sensing means being mounted on the same side plate portion as the take-up force locking means, an arm member rotatably supported about said shaft of said second gear member and having a first arm portion with a free end connected to said sensing means and a second arm portion with a free end connected to said take-up force locking means, said sensing means being adapted to operate said take-up force locking means through said arm member, a webbing-sensitive emergency locking mechanism for locking the rotation of said reel shaft means in webbing draw-out direction when the webbing is drawn out at a rate exceeding a predetermined rate, said webbing-sensitive emergency locking mechanism being mounted on said side plate portion which is adjacent to the other end of said reel shaft means, and a vehicle-sensitive emergency locking mechanism for locking the rotation of said reel shaft means in webbing draw-out direction when a deceleration over a predetermined value occurs to the vehicle, said vehicle-sensitive emergency locking mechanism being mounted on the inner surface of said side plate portion which is adjacent to said the other end of said reel shaft means.

4,349,165

COIL CARRIER WITH CARRIER ELEMENTS EXTENDING PARALLEL TO ITS AXIS

Walter Henning, Alsdorf, and Heinz-Peter Illig, Ubach-Palenberg, both of Fed. Rep. of Germany, assignors to Jos. Zimmerman, Aachen, Fed. Rep. of Germany

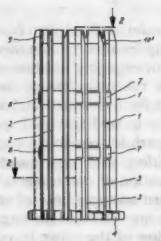
PCT No. PCT/DE79/00059, § 371 Date Feb. 27, 1980, § 102(e) Date Feb. 25, 1980, PCT Pub. No. WO80/00147, PCT Pub. Date Feb. 7, 1980

PCT Filed Jun. 22, 1979, Ser. No. 193,943

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1978, 2828121

Int. Cl.³ B65H *75/20*

U.S. Cl. 242—118.11 **13 Claims**



1. A coil carrier comprising interconnected circumferentially compressible carrier elements extending parallel to the carrier axis, said carrier elements projecting radially outwardly and forming a common cylindrical surface, and axially spaced shape-retaining coupling members (**4**, **7**; **10**; **15**; **29**, **30** to **33**; **48** to **51**) disposed between and interconnecting respective pairs of circumferentially adjacent carrier elements (**1**; **25**; **40**), said coupling members securing said carrier elements in spaced relationship while permitting uniform circumferential compression of said coil carrier throughout its axial length, and wherein the gap between each two adjacent carrier elements is larger than the dimensions of a carrier element in the circumferential direction, said carrier being axially partly insertable into a coil carrier of like construction.

4,349,166

MAGNETIC TAPE CASSETTE

Kimio Tanaka, and Toshihiko Ishida, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,007

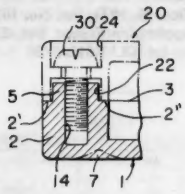
Claims priority, application Japan, Jul. 17, 1979, 54/97968[U]

Int. Cl.³ G03B *1/04;* **G11B** *15/32, 23/04*

U.S. Cl. 242—197 **2 Claims**

1. In a magnetic tape cassette for tape wound on a hub, comprising an upper half casing and a lower half casing, said lower half casing being provided with at least one screw receiver having a threaded hole near at least one corner of the lower half casing, said upper half casing being provided with

an opening corresponding to each of said screw receivers for carrying a screw, the improvement comprising a first wall portion for a screw receiver being integrally connected to two walls of the lower half casing and a second wall portion being



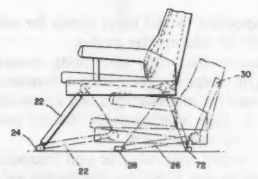
unconnected to said casing walls, at least one rib radially extending from said second wall portion, wherein said second wall portion is lessened in thickness and said rib has a top surface which is equal in height to the top surface of the walls of the lower half casing.

4,349,167

CRASH LOAD ATTENUATING PASSENGER SEAT

Mason J. Reilly, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 30, 1979, Ser. No. 89,695
Int. Cl.³ B64D *25/04, 11/06*
U.S. Cl. 244—122 R **7 Claims**



1. A collapsible safety seat for a vehicle, comprising:

a generally horizontally extending seat pan assembly having a front transverse axis and a rear transverse axis parallel to, and spaced from, said front transverse axis;

a generally vertically extending seat back assembly; and

at least one seat support assembly, which includes

a front leg having an upper end pivotally connected to said seat pan assembly for rotation about said front transverse axis of said seat pan assembly, and a lower end which includes a first axis parallel to said front transverse axis of said seat pan assembly, said front leg being pivotally connected to a floor of the vehicle for rotation about said first axis, said front leg extending upward at an angle to said floor in the direction of travel of the vehicle,

a rear leg having an upper end pivotally connected to said seat pan assembly for rotation about said rear transverse axis of said seat pan assembly, and a lower end which includes a second axis parallel to said first axis and said front and rear transverse axes of said seat pan assembly, said rear leg being pivotally connected to the vehicle floor for rotation about said second axis, said rear leg extending upward at approximately the same angle to said floor in the direction of vehicle travel as said front leg, and

an energy attenuator having a first end, an opposite second end, a trolley which is movable along a predetermined path between said first and second ends of said energy attenuator, and energy absorbing means, which when said trolley is moved in one direction along its path of travel by a first force, exerts a second force on said trolley opposing said first force, said trolley being pivotally connected to said seat pan assembly for rotation about said rear transverse axis of said seat pan assembly, said trolley being positioned adjacent said first end of said energy attenuator, said second end of said energy attenuator including a third axis parallel to said first and second axes, said energy attenuator being pivotally connected to the vehicle floor for rotation about said third axis, said energy attenuator extending upward at a second angle to said vehicle floor in a direction opposite to the direction of vehicle travel;

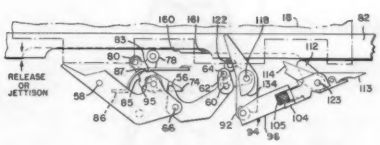
whereby upon the occurrence of a vehicle crash, said trolley is moved downward and in the direction of travel of the vehicle toward said second end of said energy attenuator by a crash deceleration force against the opposite force exerted on said trolley by said energy absorbing means, to move said seat downward and in the direction of vehicle travel at a rate of deceleration which is less than the rate of deceleration of the surrounding vehicle structure, said energy attenuator being disposed so that as said trolley is moved toward said second end of said energy attenuator, said first end of said energy attenuator is moved into said seat back assembly.

4,349,168

CARGO DELIVERY SYSTEM FOR AIRCRAFT

Franklin K. Barnes, Redmond, Wash., and Eddie D. Banks, Higashai, Japan, assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 19, 1980, Ser. No. 122,382
Int. Cl.³ B64D *1/10, 1/12*
U.S. Cl. 244—137 R **31 Claims**



1. A cargo delivery system for aircraft, comprising: two spaced apart parallel rails adapted to support a cargo carrier for movement forward and aft parallel to the longitudinal axis of an aircraft, and at least two combination airdrop/logistics locks mounted by one of the rails to respectively engage the cargo carrier at two spaced apart locations for securing the carrier at a predetermined position along the rails, and for releasing the cargo carrier in unison upon attainment of a predetermined aft force applied to the cargo carrier by parachute means deployed behind the aircraft; each of said airdrop/logistics locks including a movable detent engageable with a cargo carrier and force responsive release means including;

(a) an axially crushable force threshold element having a substantially constant resistance to deformation over a predetermined deformation range; and

(b) movable deforming means acting between said element and said detent for deforming said element and for releasing said detent upon attainment of said predetermined aft force, said predetermined deformation range being sufficient to allow said element to be partially deformed without releasing said detent so as to permit aft shifting of the cargo carrier until the detent associated with a second such airdrop/logistics lock is engaged with the cargo carrier, with additional deformation of said element occuring upon attainment of said predetermined aft force.

31. A cargo delivery system for aircraft, comprising: two spaced apart parallel rails each made up of at least two rail sections independently movable between an upright position adapted to support a cargo carrier and a stowed position adjacent a floor surface; and a plurality of lock means respectively

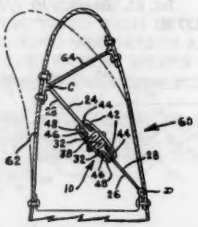
associated with the rail sections which make up one of said rails for restraining a cargo carrier supported thereby when their associated rail sections are in their upright positions, and means for remotely operating the lock means associated with only those rail sections which are located in their upright position; whereby one set of parallel rail sections may be in their upright positions for acceptance of cargo carrier borne cargo while another set of sections may be in their stowed positions for acceptance of another type of cargo.

4,349,169

CONTINUOUS FORCE ACTUATOR

Robert W. McAnally, Fort Worth, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1980, Ser. No. 178,042
Int. Cl.³ B64C *3/48*; F01B *19/04*
U.S. Cl. 244—219 **2 Claims**



1. A continuous force actuator comprising:

a housing, said housing being formed by a pair of C-shaped members, means for securing said C-shaped members together at substantially the midpoint thereof to form first and second substantially identical chambers, and a first and second space formed between respective ends of said pair of C-shaped members;

a first piston located within said first chamber and a second piston located in said second chamber, each of said pistons having an elongated arm terminating in a T-shaped protrusion extending from one end thereof, said T-shaped protrusions being slidable within said first and said second chambers, respectively, and said elongated arms being slidable within said first and second spaces, respectively, said pistons providing said continuous force;

means provided within each of said chambers for altering the position of said pistons located therein, each of said position altering means including a hollow resilient tube between one side of said T-shaped protrusion and said securing means, and a pair of hollow resilient tubes adjacent each side of said elongated arm on the other side of said T-shaped protrusion, said plurality of hollow resilient tubes also acting as a guide for said elongated arm situated within each of said chambers; and

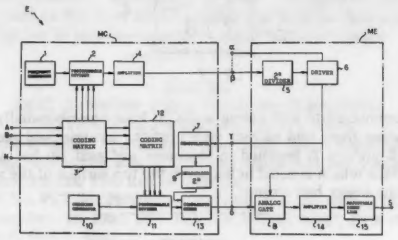
means operably connected to said position altering means for providing a motive force thereto, whereby said motive force providing means determines the amount of said continuous force.

4,349,170

SAFETY CODING PROCESS FOR TRACK CIRCUITS

Claude D. Bilet, Boulogne Billancourt; Michel G. Guillard, Villejuif, and Dominque A. Hedoin, Sceaux, all of France, assignors to Compagnie de Signaux et d'Entreprises Electriques, Paris, France

Filed Dec. 11, 1979, Ser. No. 102,431
Claims priority, application France, Dec. 22, 1978, 78 36270
Int. Cl.³ B61L *3/20*
U.S. Cl. 246—63 **10 Claims**



1. A system for producing a frequency modulated signal comprising:

input means for introducing information to be transmitted;

a generator producing a frequency generated signal;

programmable divider means for selectively dividing said frequency generated signal and producing an intermediate signal;

means responsive to said input means for selecting the division ratio of said divider means;

programmable frequency generating means responsive to said input means for generating a frequency check signal;

driver means for modulating a said intermediate signal produced by said programmable divider means to thereby produce an output signal;

operating means responsive to said frequency check signal and said output signal for producing an enabling signal when the difference between said frequency check signal and said output signal is equal to a single predetermined fixed frequency; and

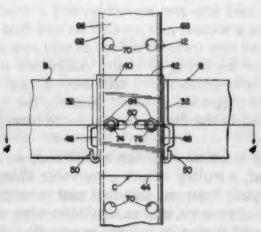
analog gate means responsive to said enabling signal produced by said operating means for delivering said output signal at the output of said analog gate means as the frequency modulated signal when said enabling signal is present.

4,349,171

SHELF MOUNTING BRACKET FOR STORAGE RACK

Mark H. Baldwin, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio

Filed Sep. 22, 1980, Ser. No. 189,189
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—243 **5 Claims**



1. A shelf mounting bracket comprising: a generally flat

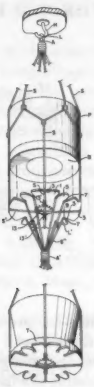
rectangular plate having top and bottom edges and opposite side edges, flanges extending from said side edges substantially perpendicular to said plate, said flanges having shelf support hooks adjacent said plate bottom edge, said hooks having hook saddles with saddle axes extending generally perpendicular to said plate, said plate having a pair of elongated spaced-apart slots therein, said slots being spaced-apart and being elongated in a direction extending across said plate side edges, and said slots being located intermediate said plate top and bottom edges.

4,349,172

PLANT POT SUSPENSION APPARATUS AND THE LIKE

John J. Banks, Jr., 501 W. Roxbury Pky., West Roxbury, Mass. 02132

Filed Apr. 28, 1980, Ser. No. 144,378
Int. Cl.³ A47G *7/04*
U.S. Cl. 248—318 **14 Claims**



9. A device for use in suspending plant pots and the like provided with a plurality of suspension strands spaced circumferentially about the pots and adapted to be secured thereto by carrying the strands from a common apex down over the sides of the pots and passing the same under the pots; the device comprising a pot-suspension disc having, in combination, a plurality of peripherally spaced guide means that are adapted for receiving and holding the strands in peripherally spaced positions when the disc is inserted between the bottom of the pot and the strand portions passed thereunder; the disc being further provided with a plurality of pairs of radial slots peripherally disposed between successive guide means and defining tongues over which may be looped the top portions of the suspension strands of a further pot to be hung directly vertically below and from the disc.

4,349,173

TILT DEVICE FOR USE WITH CATHODE RAY TUBE DISPLAY UNITS

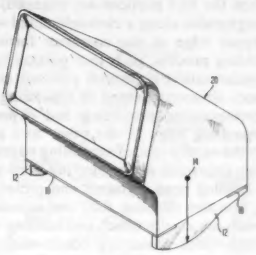
Lubomir J. Volka, Holbrook, and Robert J. Wentzel, New Hyde Park, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 24, 1980, Ser. No. 162,419
Int. Cl.³ A47B *91/00*
U.S. Cl. 248—346 **6 Claims**

1. An infinitely variable support mechanism for movably mounting a display unit comprising:

supporting platform means mountble on the underside of said display unit;

at least one rocker member connected along its top to the bottom of said platform means, said rocker member having first and second sides extending downward from the front and back ends of the top of said rocker member, respectively, the bottom of said rocker member starting at the bottom of the first side of said rocker member and continuing in a circular profile toward the second side of said rocker member, the center of said circular profile coincident with the location of the center of gravity of the supported display unit, said circular profile terminating at a point between a vertical line corresponding to the center of gravity of said display unit and the second side of said



rocker member and thence continuing therefrom in a line to the bottom of the second side of said rocker member; and

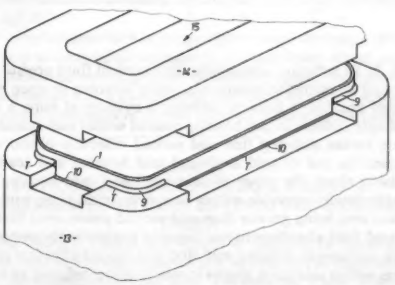
a supporting base having at least one recess therein, each of said recesses for movably receiving the circular profile of at least one of said rocker elements, whereby said display unit may pivotably tilt about its center of gravity in quasi-static equilibrium.

4,349,174

INJECTION MOLD APPARATUS FOR CONTAINERS OF PLASTICS MATERIAL

Albert Obrist, Reinach, and Hans-Werner Breuer, Balsthal, both of Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

Division of Ser. No. 60,342, Jul. 25, 1979, Pat. No. 4,252,248.
This application Nov. 13, 1980, Ser. No. 206,435
Claims priority, application Switzerland, Jul. 25, 1978, 7984/78
Int. Cl.³ B29C *1/00*; B29F *1/022*
U.S. Cl. 249—58 **2 Claims**



1. Apparatus for use in injection molding a container of plastics material, the container being of the type usable with a cover which has a side wall which engages externally over the edge of the container, with a tear-off guarantee strip which engages under a holding bead on the outside wall of the container, in the region of a design tearing line, and which, at its lower boundary surface, adjoins a protective bead which is disposed on the outside wall of the container and which is parallel to the holding bead and whose outside diameter approximately aligns with the outside wall of the guarantee strip and protects the guarantee strip from below from damage by a

force acting thereon, the protective bead being interrupted at at least two positions on its periphery and being subdivided into at least two segments, the holding bead being also divided into at least two segments, and the holding bead segments being arranged at an offset position in the spaces between adjacent protective bead segments, said injection molding apparatus comprising two axially engageable and disengageable, radially nonexpandable female tool portions with inner surfaces shaped to form the outer surface of the container sidewalls when the tool portions are engaged, said tool portions being engageable along a circumferential separating edge below the upper edge of the container formed during the injection molding process, each tool portion having substantially rectangular axially depressed portions and axially projecting portions alternating along its separating edge for mating with corresponding projecting and depressed portions along the separating edge of the other tool portion, means formed along the axially spaced separating edges of alternating pairs of mating depressed and projecting portions for forming respectively holding bead segments and protecting bead segments during injection molding, such that adjacent holding and protecting beads are axially offset, and holding beads alternate circumferentially with protecting beads, such that the bead formed by one mating pair does not interfere with axial disengagement of adjacent mating pairs.

4,349,175

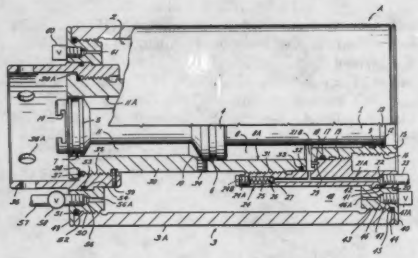
VALVE ACTUATOR HAVING A CONTINUOUSLY CHARGED ACCUMULATOR

Neil H. Akkerman, and Stephen R. Foster, both of New Orleans, La., assignors to Baker CAC, Inc., Belle Chasse, La.

Continuation of Ser. No. 777,373, Mar. 14, 1973, abandoned. This application Dec. 10, 1980, Ser. No. 215,204

Int. Cl.³ F16K *31/12*; F15B *21/00*

U.S. Cl. 251—31 **3 Claims**



1. In an actuator respondable to a control fluid pressure for moving an operative means of a valve between an open and a closed position: a housing defining a cylindrical bore; a shaft sealingly slidable in said housing coaxial within said cylindrical bore; means defining first and second effective piston areas carried by one of said shaft and said housing and sealingly slidable along the other of said shaft and said housing and longitudinally movable within said cylindrical bore, said first piston area being greater than said second piston area; first and second fluid chambers in said housing companionly associated with said means defining said first and second effective piston areas within said bore; means in said housing defining an annular accumulator chamber surrounding said cylindrical bore; a direct, continuous first fluid passage in said housing between said second fluid chamber and said accumulator chamber; a direct, continuous second fluid passage in said housing to supply pressurized, compressible control fluid to said first fluid chamber, a third direct fluid passage in said housing between said second fluid passage and said accumulator chamber; and a check valve disposed in said third fluid passage permitting free flow of pressurized control fluid into said annular accumulator chamber concurrently with the flow into said first fluid chamber, but preventing reverse fluid flow therethrough; one of said housing and said shaft being engageable with said operative means, said one of said housing and said shaft being selectively shiftable longitudinally in a first direction to move said operative means to one of said open and closed positions by application of control fluid pressure to said first chamber, one of said housing and said shaft means being selectively shiftable longitudinally in a second direction to immediately move said operative means to the other of said open and closed positions upon a subsequent decrease in applied fluid control pressure proportionately greater than the area difference of said first and second effective piston areas by release of compressed control fluid energy stored within said accumulator chamber to said second fluid chamber.

4,349,176

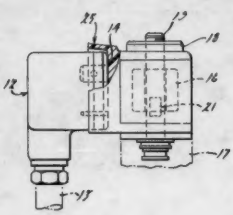
ELECTRICAL TERMINAL CONSTRUCTION

Douglas M. Thornton, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed Feb. 19, 1980, Ser. No. 122,755

Int. Cl.³ F16K *31/02*; H01R *33/06*

U.S. Cl. 251—129 **5 Claims**



1. A safety arrangement for preventing an open electrical connection from being formed with a socket of the type consisting of a socket housing having a generally rectangular peripheral surface terminating in a face surface in which female socket openings are formed, a male terminal housing having a male terminal having a surface adapted to abuttingly engage said socket housing face surface when connected thereto, a pair of flat male power terminals extending from said male terminal housing surface, a male ground terminal extending from said male terminal housing surface with a different orientation than said power terminals, and a shroud at least partially surrounding and extending from said male terminal housing surface, said shroud being formed from a pair of generally parallel legs and a single intersecting leg generally perpendicular to said generally parallel legs and integrally connected thereto, for conforming to the shape of said socket housing peripheral surface to which said male terminal housing surface is to be mated, whereby mismatching of said terminals will result in interference between said shroud and said socket housing face surface to prevent terminal insertion.

4,349,177

PUSH-BUTTON TYPE VALVE

Yukio Shimada; Naoyoshi Suzuki; Toshio Ohashi, all of Yokohama, and Yasushi Inoshita, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1980, Ser. No. 185,642

Claims priority, application Japan, Sep. 11, 1979, 54-125300[U]

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—230 **6 Claims**

1. A valve comprising:

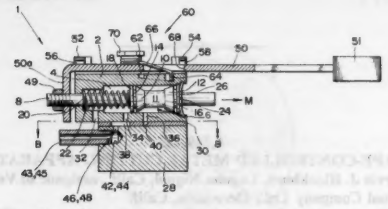
a valve body component;

a valve member movably retained in said valve body component and having first and second operative positions;

a first spring for biasing said valve member towards one of said operative positions;

an arm component operatively connected to said valve member;

a groove formed in one of said components, which groove has first and second seat portions and a substantially arrow head shape which defines said first seat portion at the sharp end thereof and said second seat portion at an apex defined by an indent at the blunt end thereof; and



a second spring carried by the other of said components and having a pin formed integrally at one end thereof, which pin is adapted to trace in said groove and to seat in said first and second seat portions to hold said valve member in said first and second operative positions respectively, said second spring being adapted to bias said pin into and across the face of said groove so that said pin traces in said groove in one direction.

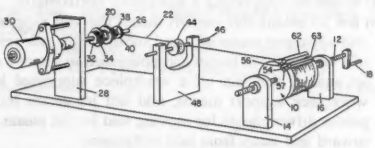
4,349,178
WIRE BLADES

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems Inc., Salem, Mass.

Division of Ser. No. 32,251, Apr. 23, 1979, Pat. No. 4,256,079, which is a division of Ser. No. 917,918, Jun. 22, 1978, Pat. No. 4,178,670. This application Aug. 1, 1980, Ser. No. 174,452

Int. Cl.³ B65H *54/02, 59/02*

U.S. Cl. 254—216 **12 Claims**



1. A system for forming a wire pack including plurality of wires of equal predetermined length extending between spaced wire supports, said system comprising:

a cylindrical roll mounted for rotation about an axis;

means spaced from said roll for supporting a source of wire to be wrapped around the exterior of said roll and exerting thereon a force in a direction away from said roll;

a guide intermediate said source and said roll for locating wire from said source relative to said roll;

a pair of said wire supports arranged to be mounted on said roll in respective positions adjacent but circumferentially spaced from each other and extending axially of said roll in position for engaging wire wrapped around said roll; and

means for engaging wire wrapped around said roll and positioning adjacent turns at regular intervals relative to each other,

said roll including an axially-extending recess in the periphery thereof, and said supports being adapted to be mounted in said recess.

4,349,179
CONTROL MEANS FOR MOTION COMPENSATION DEVICES

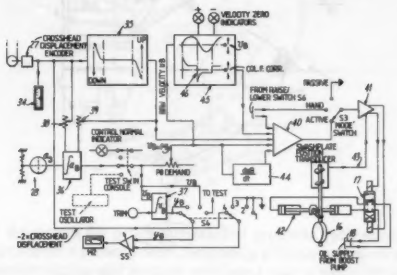
Norman R. Barber, Kent, England, assignor to GEC Mechanical Handling Limited, Kent, England

Filed May 9, 1980, Ser. No. 148,253

Claims priority, application United Kingdom, Jun. 19, 1979, 7921366

Int. Cl.³ B66D *1/50*

U.S. Cl. 254—270 **4 Claims**



1. A control system for a motion compensating arrangement for providing stabilization of a body suspended by means of a flexible line from a support structure subject to uncontrolled oscillating movements, said control system incorporating on said structure:

(A) a winch to which the line is attached,

(B) a pulley over which the line passes and from which the body is suspended, and

(C) a loop formed in the line between the winch and the pulley,

(D) the loop having a length which is resiliently displaceable from an equilibrium value,

(E) the system incorporating also an accelerometer mounted adjacent said pulley for generating a signal representative of vertical acceleration of the pulley,

(F) an integrator for deriving therefrom a signal representative of vertical velocity of the pulley,

(G) means for generating a signal representative of the amplitude of oscillations in the length of the loop,

(H) means for combining said signals to form a stabilizing signal,

(I) signal responsive means operable to alter the length of the loop in controlled response to the stabilizing signal, and

(J) means for deriving from the velocity signal a compensating signal which modifies the stabilizing signal in a manner which compensates for the effect of friction in the system.

4,349,180
DEVICE FOR HANDLING FROM A BOAT A SUBMERGED LOAD HOOKED ONTO THE END OF A CABLE

Joël M. Charles, Toulon, and Robert J. Toscano, La Seyne-sur-Mer, both of France, assignors to Etat Francais as represented by the Delegue General pour l'Armement, Paris Armees, France

Filed Aug. 13, 1980, Ser. No. 177,605

Claims priority, application France, Aug. 27, 1979, 79 21425

Int. Cl.³ B66D *1/26*

U.S. Cl. 254—277 **4 Claims**

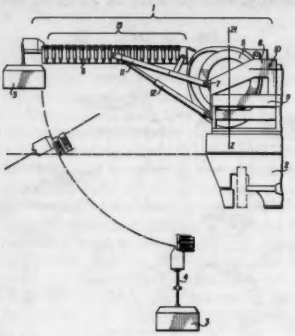
1. A device for handling, from a ship, a submerged load hooked to one end of a cable, comprising:

a cable recovery drum;

an appliance for straightline haulage upon the cable;

a straight beam with a top end and a bottom end, the appliance being disposed along and carried by said beam be-

tween said top and bottom ends, the top end hinged about a first axis transversally disposed with respect to the ship;
a hydraulic jack for controlling pivoting of the beam about said first axis;
an arm hinged to the bottom end about a second axis parallel with the first axis;



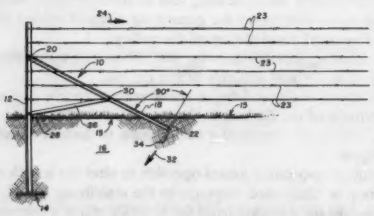
a means of guidance through which the cable passes, said means of guidance being borne by the arm; and
a pick-up of angular displacement of the arm, said pick-up automatically controlling the hydraulic jack to keep said angular displacement substantially zero.

4,349,181

END OR CORNER FENCE POST CONSTRUCTION

Lynn E. Asher, 121 Winona St., and Antony J. Conway, R.R. 1, both of Chatfield, Minn. 55923

Filed Jun. 20, 1979, Ser. No. 50,498
Int. Cl.³ E04H *17/02*
U.S. Cl. 256—35 **10 Claims**



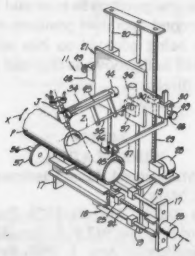
1. An end fence post construction comprising:
main upright post means with an upper and a lower end;
inclined main brace means with an upper and a lower end, said upper end of the main brace means being fixedly attached to the upper end of the main post means;
bearing plate means rigidly attached to the lower end of said main brace means and extending laterally beyond said brace means in all directions, said bearing plate means having a plate means area measured perpendicular to the main brace means substantially greater than the cross sectional area of the main brace means and having a lower narrow edge facing downwardly and lying along a plane generally perpendicular to the main brace means, said edge including a downwardly facing lower portion and widening substantially continuously upwardly from the lower portion to a region of maximum width of the bearing plate means to facilitate penetration of the bearing plate means into the ground and to resist movement of the main brace means in a direction parallel to the main brace means;
rigid cross brace means with first and second ends, said first end of the cross brace means being fixedly attached to the main post means adjacent the ground and the second end of the cross brace means extending upwardly and being fixedly attached to the main brace means; and
deadman means rigidly attached adjacent to the lower end of said post means and positioned below ground when the post means is installed.

4,349,182

TAPE-CONTROLLED METAL CUTTING APPARATUS

Marvin J. Blackburn, Laguna Niguel, Calif., assignor to Vernon Tool Company Ltd., Oceanside, Calif.

Continuation-in-part of Ser. No. 631,733, Nov. 13, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,207
Int. Cl.³ B23K *7/04, 37/04*
U.S. Cl. 266—57 **42 Claims**

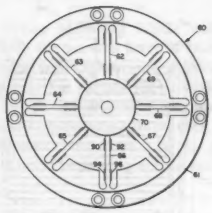


1. Automatic apparatus for cutting a workpiece by a hot jet directed against one face thereof comprising:
(a) means for supporting a workpiece horizontally;
(b) hot jet means and support means therefor supported on said apparatus essentially and substantially independently of a workpiece to be cut and positioned to direct a cutting jet against one face of a workpiece supported by said workpiece support means, said hot jet means including power driven means for moving said hot jet means bodily toward and away from said workpiece;
(c) first and second power-operated means for moving both of said support means relative to each other to enable said hot jet means to cut said workpiece along X and Y axes lying in a common plane at right angles to one another;
(d) third power-operated means for pivoting said hot jet means in an arc lying in a plane generally normal to said common plane containing said X and Y axes thereby to cut the workpiece at different bevel angles relative to said one face;
(e) preprogrammed numerical control means providing a series of control signals to said first, second and third power-operated means whereby said hot jet means is effective to cut the workpiece along a preselected contour including non-linear portions and along preselected different bevel angles during a cutting cycle; and
(f) sensing means for automatically monitoring the position of the pivot axis of said jet means relative to the surface of said workpiece and for continuously sensing the proximity of the pivot axis of said jet means to said workpiece and including power means for shifting said jet means as necessary to maintain the pivot axis of said jet means at an optimum cutting position relative to the workpiece.

4,349,183
SPRING FOR A RING LASER GYRO DITHER MECHANISM

Thomas M. Wirt, Malibu, and Robert A. Chechile, Thousand Oaks, both of Calif., assignors to Litton Systems Inc., Beverly Hills, Calif.

Filed Aug. 4, 1980, Ser. No. 175,106
Int. Cl.³ F16F 1/18, 1/34
U.S. Cl. 267—160 2 Claims



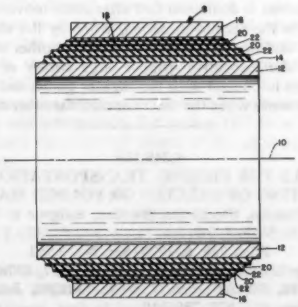
1. In the combination of a hub, a rim substantially coaxial with said hub, a plurality of radially directed springs connecting said hub and rim, each said spring being capable of flexing in a circumferential direction to allow limited relative motion between said hub and rim about the common axis of said hub and rim, the flexing of each of said springs having a radially positioned axis of inflection, the improvement comprising:

each of said springs having a reduced moment of inertia about an axis parallel to said common axis and an increased circumferential bending in the region of attachment to said rim.

4,349,184
LAMINATED BEARINGS HAVING ELASTOMER LAYERS OF VARYING DIMENSIONS

Robert R. Peterson, Hudson, and Daniel S. Ventura, Malden, both of Mass., assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Apr. 3, 1978, Ser. No. 892,478
Int. Cl.³ F16F 1/36; F16C 27/00, 33/00
U.S. Cl. 267—153 13 Claims

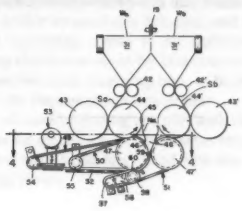


1. A compressive load carrying bearing comprising alternating layers of a resilient material and a non-extensible material generally concentrically disposed about a common axis, wherein said layers of resilient material have substantially the same modulus of elasticity and the length and thickness of successive layers of resilient material progressively decrease with increasing radii.

4,349,185
FOLDING APPARATUS

Rudolph E. Small, and Michael H. Spalding, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 21, 1980, Ser. No. 170,700
Int. Cl.³ B41L 43/00
U.S. Cl. 270—32 7 Claims

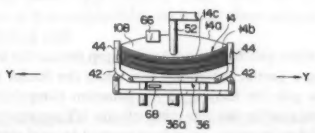


1. Apparatus for producing stacked products such as paper napkins from a primary web comprising a frame, means on said frame for slitting said primary web into a pair of webs, advancing said pair of webs along side-by-side paths while longitudinally folding each web, and thereafter transversely severing each web to develop a first and a second series of discrete web products, a pair of folding rolls journalled in said frame, one for each of said series, vacuum means operably associated with said rolls for transversely folding each product, and endless belt means for stripping products from the roll of said first series and thereafter urging said product against a product carried by the roll of said second series for delivering both products in superposed relation along a horizontal path.

4,349,186
THIN SHEET FEEDING APPARATUS

Kunihiko Nakamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1980, Ser. No. 127,746
Claims priority, application Japan, Mar. 9, 1979, 54-27358; Dec. 13, 1979, 54-162027
Int. Cl.³ B65H 3/46, 1/18
U.S. Cl. 271—18 9 Claims



1. A thin sheet feeding apparatus comprising:

means for supporting a pile of thin sheets bundled by a belt member;

means for moving said pile in a predetermined direction;

means for bending said pile of thin sheets, said means for bending including means for applying forces to the edges of said pile which are in contact with said belt member, said means for applying forces being adapted to apply forces only in the direction of the plane of said sheets and in said predetermined direction, so that the upper surface of said pile is bent into a concave form and the portion of said band corresponding to said upper surface separates from said upper surface while remaining in contact with said edges of said pile; and

means for sequentially feeding at least the uppermost thin sheet of said pile in a second predetermined direction, said uppermost thin sheet being on the concave side of the pile.

9. A thin sheet feeding method comprising the steps of:

(a) moving a pile of thin sheets bundled by a belt member and maintaining the uppermost thin sheet of the sheet pile at a predetermined level;

(b) applying forces on both parallel side faces of the sheet pile so bundled, bending said pile to cause the uppermost thin sheet to be spaced apart from the belt to permit a space to be created therebetween, and maintaining the pile at its bent configuration; and

(c) feeding one sheet at a time from the uppermost thin sheet side of the sheet pile in a predetermined direction.

4,349,187

SHEET FEEDER WITH NONSTOP DEVICE

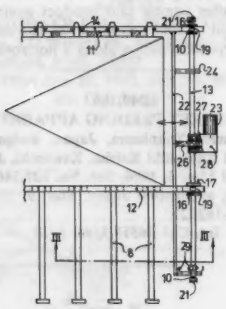
Klaus Weyrich, Augsburg, Fed. Rep. of Germany, assignor to Georg Spiess, Gersthofen, Fed. Rep. of Germany

Filed Mar. 14, 1980, Ser. No. 130,248

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911735

Int. Cl.³ B65H *1/26*

U.S. Cl. 271—159 **21 Claims**



1. In a sheet pile feeder with a nonstop device for supporting and lifting a partial remaining pile while the feeder receives a fresh new pile for feeding, a combination comprising: guideways elongated in the direction of pile lifting; stringers movable in said guideways; cross bars carried by said stringers and adapted to support a partial pile to be lifted; means mounting said cross bars for sliding movement transversely to the direction of withdrawal of sheets from the partial pile; a direction-reversible motor operatively connected with said cross bars to move the same transversely in one or in an opposite direction; and means for sensing at least one upper side edge of the partial pile and connected with said motor to make the same operate in one or in another direction depending upon sensed conditions, said partial remaining pile being laterally adjustable for adjusting sheets laterally in nonstop operation; said sensing means comprising further at least one sensing device for effecting automatic straightening of the side positions of the new pile and the partial pile; a receiver for the new pile and being laterally slidable by means of an associated motor, said sensing device being coordinated with both of said motors; and a selector switch for selecting operation of said nonstop device and serving to couple said sensing device alternatively to one or the other of said motors.

4,349,188

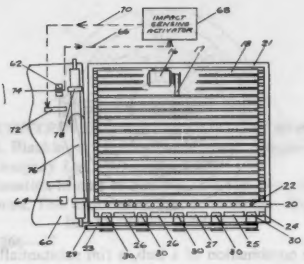
RE-REGISTERING FEEDER AND METHOD OF REGISTERING

William G. Young, 79 Atterbury Blvd., Ste. 201C, Hudson, Ohio 44236

Continuation-in-part of Ser. No. 30,722, Apr. 18, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 275,885

Int. Cl.³ B65H *5/00*

U.S. Cl. 271—225 **2 Claims**



1. In an apparatus comprising a pre-registering feeder for a substantially rectangular sheet which includes in combination:

a base;

a plurality of parallel conveyor rolls rotatably mounted on said base;

a drive means for said parallel conveyor rolls for a movement of a sheet in a first direction;

a frame member mounted on said base parallel to and above the last conveyor roll in the first direction of travel;

means carried by said frame member in rotational contact with said last conveyor roll for holding down said sheet;

a side register guide;

a plurality of complementary pairs of drive rolls mounted in conjunction with said side register guide to grip said sheet along the margin of said sheet after a respective edge of the sheet has been registered adjacent thereto and to move said sheet in a second direction at right angles to the first direction, while the sheet is continuously actuated in said first direction to hold the respective edge flush along its full length to the register guide;

a drive means for said pairs of drive rolls;

a pair of alignment stop means arranged in angled cooperative relation to the side register guide whereby one of the stop means is contacted first after some movement of the sheet in the second direction, whereby the sheet pivots about said one stop means toward the other stop means while the respective gripper edge corner of the sheet remains in contact with the register guide; and

means to sense when the sheet contacts the other stop means.

4,349,189

MODULE FOR PICKING, TRANSPORTATION AND DEPOSITING OF SHEETED OR FOLDED MATERIAL

Lars G. Edström, Stockholm, Sweden, assignor to Malmöhus Invest AB, Malmö, Sweden

Filed Feb. 6, 1979, Ser. No. 9,953

Claims priority, application Sweden, Feb. 7, 1978, 7801396; Feb. 7, 1978, 7801397; Feb. 7, 1978, 7801398; Feb. 7, 1978, 7801399; Jun. 15, 1978, 7806910

Int. Cl.³ B65H *9/16, 5/16*

U.S. Cl. 271—251 **5 Claims**

1. Conveyor module for interconnection with identical modules for transport and registration of non-rigid sheet-like material, which sheet-like material during transport is placed on top of one another, comprising:

means defining a conveyor;

a control device arranged to control movement of and to

register the sheet-like material which is to be transported by the conveyor in a desired direction of transport;

at least one elongated belt-like driving means (3) for driving said non-rigid sheet-like material along said conveyor;

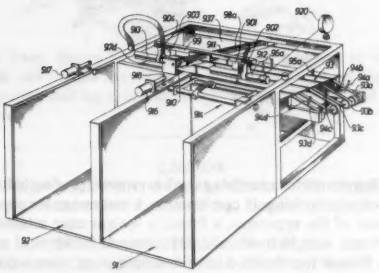
said conveyor including a substantially flat surface (36) below which said belt-like driving means (3) runs;

a motor (10) coupled to said at least one belt-like driving means for driving same;

the direction of travel of said belt-like driving means being placed at a sharp angle in relation to said control device (37);

said control device including a side wall (37) extending upwardly from the vertical level of said belt-like driving means, said side wall (37) forming a second sharp angle to said substantially flat surface (36);

said at least one belt-like driving means comprising a plurality of separated upstanding drivers (94*a*, 95*a*, 96*a*) moved by said belt-like driving means in the same direction of travel as said belt-like driving means, said drivers protruding above said substantially flat surface (36) to abut and move said sheet-like material along the conveyor with force components directed parallel to said side wall (37) and directed toward said side wall (37), said parallel force being substantially greater than said perpendicular force; and



said conveyor modules each including engagement means at respective opposite ends thereof for engagement and cooperation with another identical conveyor module located adjacent thereto and to align the conveying paths of adjacent identical conveyor modules;

said belt-like driving means protruding at one end of the conveyor module beyond the end of said substantially flat surface (36) so as to be received by an adjacent conveyor module, the direction of travel of the protruding part of said belt-like driving means deviating in a vertical direction from the direction in which it travels when running along said substantially flat surface (37) so as to provide clearance for a driving means of the adjacent conveyor module.

4,349,190

SHEET CLASSIFYING SYSTEM HAVING DEFLECTING DEVICE

Tamaki Kaneko, Fujisawa; Kunio Hibi; Sunao Ikeda, both of Yokohama; Tugio Okuzawa, Tokyo; Yohtaro Kakitani, and Hideo Kikuchi, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Sep. 23, 1980, Ser. No. 190,063

Claims priority, application Japan, Sep. 29, 1979, 54-126004; Jan. 17, 1980, 55-3066; Feb. 29, 1980, 55-27007[U]; Feb. 29, 1980, 55-27008[U]

Int. Cl.³ B65H *29/54*

U.S. Cl. 271—297 **5 Claims**

1. A sheet classifying system comprising:

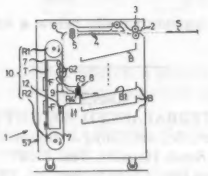
a plurality of sheet receiving bins superposed one above another in predetermined spacing relationship;

a sheet guide device including sheet conveyor belts arranged vertically along an inlet end of said sheet receiving bins;

a plurality of sets of sheet separating claws located in a plurality of layers along said sheet conveyor belts and each set being disposed in a position corresponding to one of said sheet receiving bins; and

a guiding device moved vertically by said sheet guide device along said sheet conveyor belts, vertical movement of said guiding device successively bringing said plurality of sets of sheet separating claws to an operative position for deflecting sheets conveyed by said conveyor belts toward the respective sheet receiving bins, to be received therein; wherein the improvement comprises:

a plurality of cams operating as a unit with the sheet separating claws for displacing the sheet separating claws, at least one of said cams being associated with one set of said sheet separating claws;



engaging means mounted in said guiding device and operative to come into and out of engagement with said cams for moving said sheet separating claws between an operative position and an inoperative position;

sheet separating claw returning means urging said sheet separating claws to move toward said inoperative position at all times;

a mechanism for upwardly moving said guiding device;

a solenoid for actuating said mechanism for moving said guiding device upwardly;

said engaging means being in engagement with one of said cams for displacing said sheet separating claws; and said solenoid being operative to actuate said mechanism for upwardly moving said guiding device and keep said engaging means in a position away from the position in which it is in engagement with said sheet separating claw displacing cam.

4,349,191

ABDOMINAL SIDEBEND MACHINE-UPPER

Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587

Filed Dec. 5, 1979, Ser. No. 100,573

Int. Cl.³ A63B *23/02, 21/06, 21/16*

U.S. Cl. 272—118 **11 Claims**

1. An upper abdominal sidebend machine comprising in combination:

a base frame which carries a weight supporting cage thereon,

a seat means supported by said base frame,

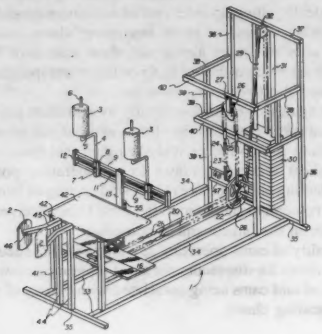
roller means deployable about said seat and having at least one pad disposed thereon,

wherein said pad engages substantially an upper portion of an exercisor's body above the waist,

and weight means are connected to said roller means

whereby when said roller means are deployed about said seat, work is done by rotating the upper torso against the weights at the waist and wherein said roller means further comprises an "L" shaped framework pivoted at an ex-

tremity of a horizontal leg of the "L", and supported by an underlying roller attached to an other extremity of said horizontal leg substantially below a vertical leg of said "L".



4,349,192

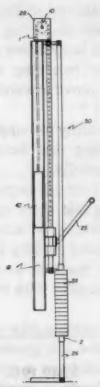
COUNTERBALANCED WEIGHT SYSTEM

Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587

Filed Dec. 17, 1979, Ser. No. 103,895

Int. Cl.[3] A63B *21/06*

U.S. Cl. 272—118 **6 Claims**



1. An exercise machine comprising in combination:

a framework including a base,

a pair of vertically upstanding support members emanating from said base,

a cross bar support connecting vertical termini of said upstanding support members remote from said base,

a plurality of weights supported on said framework, the magnitude of said weights being adjustable,

upper and lower U-shaped support braces connected to said support members,

two pairs of guide rods disposed between said support braces,

I guides slidably disposed on said guide rods,

means connecting said I guides to said weights,

means to move said weights in performing an exercise and fastened to said I guides,

counterbalance means for negating the intrinsic weight associated with said moving means and said I guides,

and chain means extending between said counterbalance means and said I guides to operatively connect said counterbalance with said moving means.

4,349,193

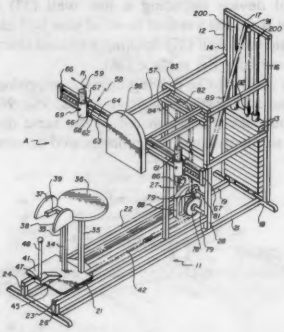
LOWER ABDOMINAL TWIST MACHINE

Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587

Filed Jun. 30, 1980, Ser. No. 164,168

Int. Cl.[3] A63B *21/06*

U.S. Cl. 272—118 **10 Claims**



1. Apparatus for exercising the lower portion of an individual's body comprising, in combination, a seat means for supporting user of the apparatus, a frame, a weight cage attached to said frame, weight means slidably mounted for vertical movement from a rest position in said weight cage, means on said frame for mounting the seat means for rotary movement throughout an arcuate path, hand gripping means on said frame accessible to an individual seated on said seat means to assist rotation of said seat means by an individual seated thereon by providing a pressure bearing surface, drive means for drivably connecting said weight means to said seat means, said drive means being adapted to rotate said seat means from a predetermined rotary position corresponding to said rest position of said weight means and to move said weight means vertically upward during the rotary movement of said seat means by an individual along said arcuate path from said predetermined rotary position.

4,349,194

APPARATUS FOR EXERCISING THE INNER AND OUTER THIGH MUSCLES

Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587

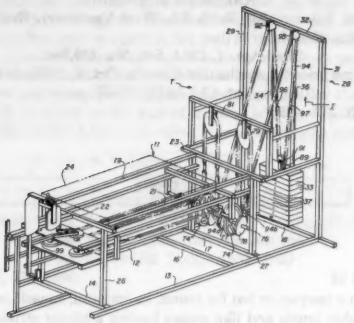
Filed Aug. 20, 1980, Ser. No. 179,726

Int. Cl.[3] A63B *21/06*

U.S. Cl. 272—118 **16 Claims**

1. Apparatus for exercising the inner and outer muscles of the thigh comprising, in combination, a frame, a seat on said frame, a weight cage on said frame, weight means guideably disposed in said weight cage for vertical movement between a rest position and an elevated position, leg receiving means on said frame for each of the leg's of a user, means for pivotally mounting each of said leg receiving means for independent rotary movement in an arcuate path from a predetermined rotary position and drive means for drivably connecting each of said mounting means to said weight means, said drive means being adapted to move said weight means from said rest position corresponding to said predetermined rotary position of said leg receiving means on said arcuate path into said elevated position by a lateral movement of the user's legs for exercising the inner and outer thigh muscles of the user wherein, said mounting means includes means for adjusting said predeter-

mined rotary position of said mounting means defined by plate members fixed to said drive means having plural apertures thereon and engagable to said leg receiving means by operating lever means pivoted to said leg receiving means, said operating lever means having a pin element adapted to reside within one of said apertures for locking engagement thereby reorienting said leg receiving means relative to each said plate member.



4,349,195

STANDING SUPPORT FOR HANDICAPPED PERSONS

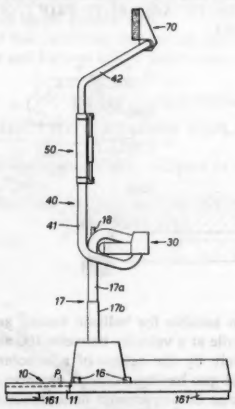
Malcolm Johnston, 46 Ladbroke Sq., London, England (W11 3ND)

Filed May 14, 1980, Ser. No. 149,612

Claims priority, application United Kingdom, May 15, 1979, 7916851

Int. Cl.³ A63B *21/00*; A61F *3/00*

U.S. Cl. 272—134 **11 Claims**



1. A standing support frame for handicapped persons comprising a platform, a column mounted upright on the platform so as to be pivotable to a limited degree in all directions from a mean position, means for resiliently urging the column to said mean position, a pair of upright horizontally spaced support arms, a knee support including a cross-piece mounted to the column, said arms being joined at their lower ends to said cross-piece and at their upper ends to a chest support, and a buttock support extending between said arms at an appropriate position, wherein said arms extend rearwardly from said knee support, upwardly at a rearward spacing from the column and forwardly above said buttock support to said chest support.

4,349,196

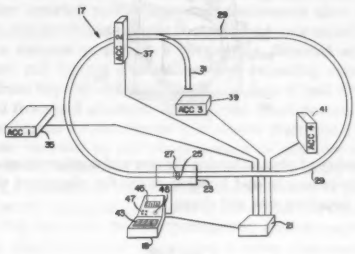
COMPUTER CONTROL TOY TRACK SYSTEM

Jay Smith, III, Pacific Palisades; Thomas G. Schneider, Mar Vista, and Thomas H. Grimm, Manhattan Beach, all of Calif., assignors to Smith Engineering, Santa Monica, Calif.

Filed Feb. 8, 1980, Ser. No. 119,645

Int. Cl.³ A63B *71/00*; A63F *9/14*

U.S. Cl. 273—1 GC **4 Claims**



1. In a toy track system wherein a plurality of cars move under the control of an operator, improved operator involvement apparatus, comprising:

means attached to each of a plurality of cars on the track for uniquely identifying each car;

means for sensing the passage and identity of each car having an identifying means;

a keyboard means for providing keyboard signals;

microprocessor means having input and output channels, said microprocessor means being responsive to said sensing means and said keyboard signals through said input channels;

a plurality of light emitting diode means receiving signals from said microprocessor means through the output channels for indicating information to the operator;

a speaker means receiving signals from said microprocessor means through the output channels for indicating information to the operator;

a plurality of seven segment display elements receiving signals from said microprocessor means through the output channels for indicating information to the operator; and

wherein said microprocessor means is programmed to scramble the order of the car identities stored in memory and display the new order sequentially upon a request from the keyboard.

4,349,197

MATCHING GAME

Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed Dec. 11, 1980, Ser. No. 215,271

Int. Cl.³ A63F *9/00*; G09B *19/00*

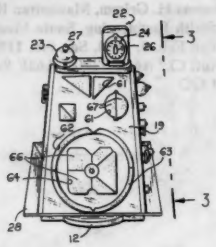
U.S. Cl. 273—1 GF **7 Claims**

1. A matching game comprising

an upright housing having slanting sides and a trough about the bottom thereof,

the sides of said housing having indentations of different configurations,

a base mounting said housing for rotation about a vertical axis, and



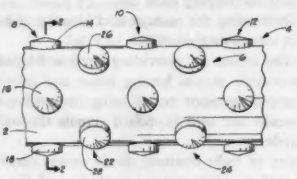
a plurality of objects having the size and configuration of the indentations in said housing saides for placement therein by matching size and shape.

4,349,198

STRING FOR SPORTING GOODS

Larry W. Stelck, 116 Easy Street Ct., Edmond, Okla. 73034

Filed Dec. 8, 1980, Ser. No. 214,188
Int. Cl.³ A63B *51/02*
U.S. Cl. 273—73 D **9 Claims**



1. A string, comprising:
an elongated member; and
a plurality of protuberances extending outwardly from said elongated member, said plurality of protuberances including:
a first set of protuberances disposed along a first perimeter of said elongated member, each protuberance of said first set being associated with a respective radius which extends to said first perimeter of said elongated member; and
a second set of protuberances disposed along a second perimeter of said elongated member, each protuberance of said second set being associated with a respective radius which extends to said second perimeter of said elongated member and which extends substantially parallel to a radius extending to said first perimeter and lying between consecutive ones of said respective radii associated with respective protuberances of said first set of protuberances, said radius which extends to said first perimeter and which lies between consecutive ones of said respective radii associated with respective protuberances of said first set of protuberances bisecting an angle formed by said respective radii associated with respective protuberances of said first set of protuberances.

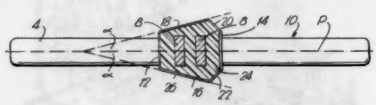
2. In an article for imparting spin to a ball of the type including a framework having a handle and a hoop extending from one end of said handle, the improvement comprising:
a line, connected in a network to said hoop, having a plurality of protuberances extending therefrom for engaging the ball, said plurality of protuberances including:
a first set of protuberances disposed along a first circumference of said line; and
a second set of protuberances disposed along a second circumference of said line, each protuberance of said second set being offset from each protuberance of said first set.

4,349,199

RACQUET HANDLE

Richard Vulcano, 235 Keith Rd., West Vancouver, British Columbia, Canada

Filed Apr. 1, 1981, Ser. No. 249,966
Claims priority, application Canada, Oct. 6, 1980, 361627
Int. Cl.³ A63B *49/08*
U.S. Cl. 273—75 **5 Claims**



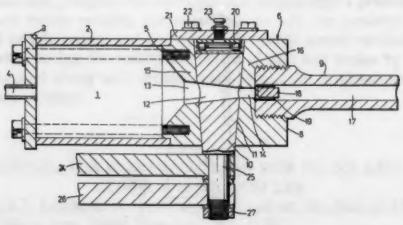
1. In a racquet or bat for tennis, badminton, squash, racquetball, table tennis and like games having a planar striking face extending from a handle, the improvement wherein said handle comprises: first and second parallel longitudinally extending minor surfaces positioned, in transverse cross-section, normal to the plane of the striking face; and
a pair of longitudinally extending relatively angled major surfaces which, in transverse cross-section, are inclined with respect to said first normally positioned minor surface at equal angles in the range of about 95° to 100°.

4,349,200

GAS GUN FOR BALLISTIC TESTING

Felix R. Wakefield, Didcot, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 28, 1980, Ser. No. 172,886
Int. Cl.³ A63B *65/12*; F41F *1/04*
U.S. Cl. 273—371 **13 Claims**



1. A gas gun suitable for ballistic testing and operable to propel a projectile at a velocity between 100 and 1000 meters per second solely by the action of a noncombustible compressed gas, said gun having a charge chamber, an inlet valve to admit a charge of compressed noncombustible gas to the charge chamber, a barrel to receive a projectile, and an outlet valve located between said charge chamber and said barrel and adapted to be moved rapidly from a closed to an open position relative to said charge chamber and barrel to effect communication between the charge chamber and the breech end of the barrel for releasing the compressed noncombustible gas from said charge chamber to the breech end of said barrel to propel said projectile through and out of said barrel, said outlet valve being a rotary valve consisting of a frustoconical valve member, rotatable within a complementary seat, and having a radial bore extending therethrough in a direction transverse to the axis of rotation of said valve member for connecting together two parts in the wall of said seat respectively connected to said

charge chamber and said breech end of the barrel, said radial bore being of tapered configuration and having its larger end disposed toward said charge chamber and its smaller end disposed adjacent the breech end of said barrel when said valve member is in its open position with the charge chamber in communication with the barrel via said bore, the larger end of said radial bore being the inlet end of said bore and complementing a first port in a part in the wall of the seat adjacent the charge chamber when said valve is in its said open position, and the smaller end of said radial bore being the outlet end of said bore and complementing a second port, smaller than said first port, in a part in the wall of the seat adjacent said breech end of the barrel when said valve is in its said open position.

4,349,201

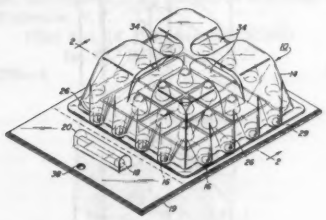
MAGNETIC DROP GAME

Melford D. Clark, 741 Piper La., Prospect Heights, Ill. 60070

Filed Sep. 8, 1981, Ser. No. 300,166

Int. Cl.³ A63B *71/02*; A63F *7/02*

U.S. Cl. 273—400 **10 Claims**



1. A game device comprising in combination
a base member having at least one ball receiving target pocket,
a plurality of magnetic balls,
a dome-like, transparent cover secured over said base member and said target pocket, and
a plurality of ball receiving receptacles partially defined by said cover and located below said target pocket.

4,349,202

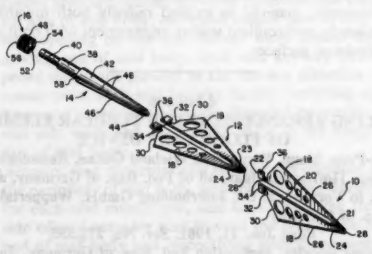
ARROWHEAD WITH READILY REPLACEABLE BLADES

David F. Scott, Harwinton, Conn., assignor to FAD Company, Inc., Bristol, Conn.

Filed Jul. 10, 1981, Ser. No. 281,958

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—422 **11 Claims**



1. An arrowhead assembly comprising: first and second generally delta-shaped blades, each blade having a longitudinal slot extending forwardly from the rear end thereof and defining a pair of symmetrically disposed blade members having first outer edge elements that converge forwardly from a first point to a tip portion of said blade and are sharpened along at least a part of their length, and having second outer edge elements that converge rearwardly therefrom to an engagement portion adjacent said slot therein, said second blade being seated within said slot of said first blade with said tip portion thereof fixedly engaged behind said tip portion of said first blade and with said slots thereof substantially coextensive, said engagement portion of at least said first blade including a narrow prong extending rearwardly from each blade member thereof and having an outwardly projecting lug thereon; a core member inserted axially into said coextensive slots of said blades and providing support therefor, said core member having an element providing a rearwardly disposed abutment surface, and having a shank portion extending rearwardly therefrom beyond said blades with said lugs of said first blade spaced from said abutment surface, said shank portion having means thereon for attachment to an arrow shaft; and a locking member mounted on said shank portion of said core member adjacent said abutment surface thereof, said locking member having a passageway therethrough and a plurality of peripherally spaced engagement elements adjacent one end thereof and extending inwardly into the passageway therethrough to define a coaxial aperture of reduced relative dimensions, said engagement elements of said locking member lying within the spaces between said lugs of said one blade and said abutment surface of said core member, and locking said lugs therebehind, said locking member being rotatable on said shank portion to an unlocked position in which said lugs can pass through the peripheral gaps between said engagement elements thereof, thereby permitting said blades to be dismounted forwardly from said core member.

4,349,203

FLANGE CONNECTION TO CONNECT A METALLIC AND A GLASS OR CERAMIC STRUCTURAL ELEMENT

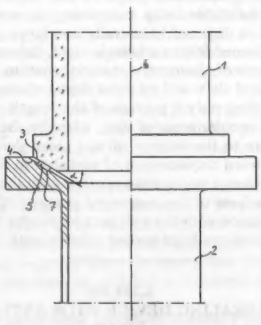
Karl A. Schülke, Neuberg, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 290,885

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033989

Int. Cl.³ F16J *15/10*

U.S. Cl. 277—26 **10 Claims**



1. Flange connection between two coaxial tubular elements (1, 2) having substantially different thermal coefficients of expansion, and particularly for use in connections wherein one the elements is brittle and has low tensile strength in comparison to that of the other,
wherein each of said elements is formed with mutually matching seating surfaces (3, 4), and an elastic sealing ring (5) is provided, interposed between said seating surfaces, and wherein, in accordance with the invention,
the seating surfaces extend at an inclination with respect to the common axis (6) of the tubular elements and form a

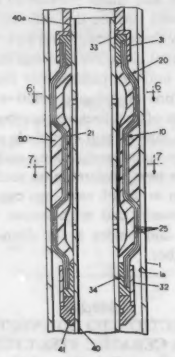
shallow truncated cone having its theoretical apex in the center of said axis (6) of one of the elements;
and the seating surfaces form a cone angle (α) with respect to a plane perpendicular to said axis, which angle (α) is at least arc tan μ_0, and up to 45°,
wherein μ_0 is defined by the coefficient of friction between the sealing material and that one of the elements which includes the cone as a theoretical core.

4,349,204

NON-EXTRUDING INFLATABLE PACKER ASSEMBLY

Billy C. Malone, Pearland, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Apr. 29, 1981, Ser. No. 258,706
Int. Cl.³ E16J *15/46*; E21B *33/127*
U.S. Cl. 277—34 **6 Claims**



1. An extrusion resistant inflatable packing device for a subterranean well bore to provide a seal between a conduit carrying the device and an interior surface within the well bore, comprising: an axially elongated, annular inflatable body; an annular means collar rigidly secured to each end of said inflatable body; means for mounting said collar means in a well bore permitting axial movement of said collars toward each other; said inflatable body comprising an annular array of elongated slats disposed in laterally overlapping relation, said slats being formed from a relatively rigid, deformable material; an inner sleeve of elastomeric material abutting the inner wall defined by said slats; and an outer sleeve of elastomeric material surrounding only a portion of the length of the external wall of said annular array of slats, whereby the application of fluid pressure to the interior of said inner sleeve produces a radially outward displacement of said slats to force said outer elastomeric sleeve into sealing relation with the well bore and the outer surfaces of the uncovered portions of said slats into frictional relation with the well bore to thereby resist extrusion of said outer sleeve from scaling relation with said well bore.

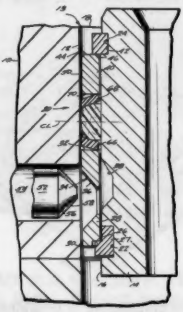
4,349,205

ANNULUS SEALING DEVICE WITH ANTI-EXTRUSION RINGS

John K. McGee, and Charles D. Bridges, both of Houston, Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 19, 1981, Ser. No. 265,223
Int. Cl.³ F16J *15/18, 15/32*
U.S. Cl. 277—188 A **18 Claims**

1. For sealing an annulus defined between a pair of coaxially-related radially inner, radially outwardly facing and radially outer, radially inwardly facing circumferentially extending at least generally cylindrical surfaces at a level intermediate the common axial extent of these surfaces;
a sealing device comprising:
a ring of elastomeric material sandwiched coaxially between two anti-extrusion rings made of elastic hard metal or the like;
this sandwich of rings being capable of providing, in a free state, a circumferential clearance radially between itself and at least one of said surfaces when received in said annulus at said level, at least before having ever been used to seal said annulus at said level;
each anti-extrusion ring comprising an annular ring integrally provided at one radial extreme thereof with a circumferentially extending lip;
the ring of elastomeric material having two axially opposite ends, a radially inner circumferential sidewall surface and a radially outer circumferential sidewall surface;
the bodies of said anti-extrusion rings, when said sealing device is in said free state, being at least generally frustoconically beveled, and being then so related to the ring of elastomeric material that is sandwiched between them that the anti-extrusion rings axially confront the axially opposite ends of



the ring of elastomeric material to a greater degree toward the radial extent thereof which corresponds to that from which the respective lips extend, said lips also then extending axially generally towards one another at obtuse angles to the respective said bodies;
the sealing device being so constructed and arranged that when received in said annulus at said level and axially compressed, the bodies of the two anti-extrusion rings tend to de-bevel toward greater flatness in a sense which forces the respective lips to contact and progressively deflect against the correspondingly adjacent said cylindrical surface and in resilient sealing engagement therewith while the body of each anti-extrusion ring at the opposite radial extreme thereof from said one radial extreme adjacently confronts the other of said cylindrical surfaces, whereupon continuing axial compression of the sealing device forces the ring of elastomeric material to expand radially both inwards and outwards, into resilient sealing engagement with both of said cylindrical surfaces.

4,349,206

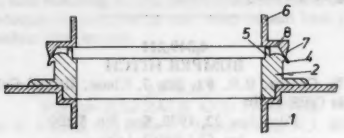
SEALING ARRANGEMENT FOR TUBULAR ELEMENTS OF FLOOR CARE DEVICE

Hans-Peter Simm, Wuppertal; Wieland Gühne, Remscheid, and Klaus Hoffmann, Haan, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,555
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 8015672[U]
Int. Cl.³ F16J *15/10, 15/32*
U.S. Cl. 277—207 R **8 Claims**

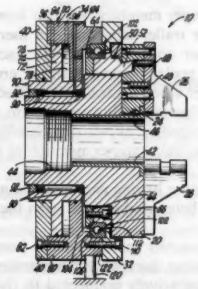
1. A sealing arrangement for sealing two tubular members of a floor care device, the tubular members being axially movable toward and away from one another and arranged to pass a gaseous medium, the sealing arrangement comprising an elastic

ring arranged to be provided on one of said tubular members and having two lips, said lips including radially inner and outer lips located V-shaped and having an end face; and a V-shaped



edge arranged to be provided on an end face of the other of said tubular members and cooperating with said radially outer lip of said elastic ring upon movement of the tubular members toward one another.

4,349,207
FLUID ACTUATED CHUCK
Anton Fink, Searingtown, N.Y., assignor to Metrology Systems Corp., Plainview, N.Y.
Filed Nov. 14, 1980, Ser. No. 207,013
Int. Cl.³ B23B 31/30, 5/34
U.S. Cl. 279—4 **2 Claims**



1. A rotatable chuck capable of holding a workpiece and adapted to be rotatably driven by a drive means comprising:

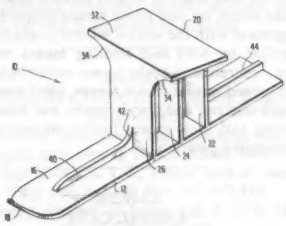
a generally cylindrical body having opposed workpiece holding and driving ends, said body being adapted to be rotated about its longitudinal axis by said drive means connected to its driving end, said body including a plurality of master jaws slidably mounted in radially extending grooves on said workpiece holding end such that said master jaws are radially movable relative to the longitudinal axis of said body, each said master jaw having a keyway opening on the end thereof most distant from the driving end of said body, each said keyway having opposed side walls parallel to the moving direction of said master jaws, each said keyway further including opposed inner and outer bearing walls disposed perpendicular to said side walls and at an acute angle to the longitudinal axis of said body;

an actuator ring concentrically and slidably disposed around the periphery of said body, said actuator ring having a key for each said master jaw, said keys projecting from one side of said actuator ring toward the workpiece holding end of said body and respectively slidably engaged with said master jaw keyways such that axial movement of said actuator ring relative to said body is operative to effect the radial movement of said master jaws, the opposite side of said actuator ring having an annular slot;

a reciprocating piston-cylinder drive assembly rotatably mounted about said body, said drive assembly including a fluid transfer means having first and second channels arranged such that alternate ejection and evacuation of fluids into said cylinder, about said piston, causes the axial movement of said cylinder relative to said chuck body, said drive assembly further including an integrated array of lubrication channels to facilitate the introduction of lubricants to reduce friction between said body and said drive assembly, said drive assembly further including an annular lip; and

radial thrust bearing means coupled between said reciprocating means and said actuator means, said radial thrust bearing means including a radially outer circular race secured to the annular lip of said drive assembly, and a radially inner circular race secured to the annular slot of said actuator ring, whereby when said body is rotated independently, relative to said piston-cylinder drive assembly, said radial thrust bearing means is operative to transfer the axially directed forces generated by said drive assembly to said actuator ring thereby effecting the radial movement of said master jaws.

4,349,208
UNITARY SKI-SLED
Max H. Merrill, R.F.D. #1, Rutland, Vt. 05701
Filed Jul. 23, 1980, Ser. No. 171,487
Int. Cl.³ B62B 13/16
U.S. Cl. 280—12 K **5 Claims**



1. A ski-sled, composed of a unitary piece of material molded in a two-piece, mirror-image mold whose halves mate along the longitudinal centerline of the ski-sled, and having:

(a) a runner portion having a substantially planar, lower snow-contacting surface, a substantially planar top surface, and an upwardly curved front tip;

(b) a substantially rectangular and planar seat portion inclined downwardly from its front edge to its rear portion at an angle to the horizontal;

(c) a first planar, transverse, upright support wall portion extending integrally and substantially perpendicularly from the top surface of the runner to the front edge of the seat;

(d) a second, planar, transverse, upright support wal portion extending integrally and substantially perpendicular from the top surface of the runner to the rear edge of the seat;

(e) a third, planar, transverse, upright support wall portion extending integrally from the top surface of the runner to the seat intermediate said first and second support walls; and

(f) a lower guide ridge extending integrally from and along the lower, snow-contacting surface of the runner.

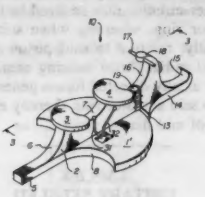
4,349,209
SNOW SHUTTLE
Edward L. Chilzer, 796 E. Main St., Monongahela, Pa. 15063
Filed Aug. 11, 1980, Ser. No. 176,762
Int. Cl.³ B62B 13/04
U.S. Cl. 280—16 **5 Claims**

1. A snow-shuttle comprising, in combination:

a frame means for placement on terrain, having seating means on a top portion thereof, a terrain contacting bottom surface, a leading edge of which has an upwardly

turned contour, and a top surface which provides a foot support area, depending ribs on said bottom surface, said seating means includes an upstanding wall member carrying seats thereon, a front face of said wall member having a second portion of pivot area defined by spaced, stacked apertures leaves oriented for interdigitation with a one other portion, and a pintle extending therethrough,

a steering means disposed forwardly of said frame means and articulated thereto, having a terrain contacting runner, handgrips extending from said runner, said one portion pivot area between said frame means and said runner, a



depending rib on said runner having an upwardly curved leading edge, said hand grips connected to said runner through a medial support having at said one portion of said pivot area thereon spaced stacked apertured leaves,

and brake means on said frame means adapted for frictional engagement with the terrain whereby said snow-shuttle is controlled by both said steering means and said brake means, wherein said brake means comprises a reinforcing rod disposed in said frame means, cleat means extending through said rod and frame means, and handle means for orienting said cleat means from a terrain engaging to a non-engaging position.

4,349,210

ANIMAL CART

Kenneth M. Rutt, 2146 Stonecrest Dr., Lancaster, Pa. 17601

Filed Feb. 23, 1981, Ser. No. 237,523
Int. Cl.³ B62B *1/14*
U.S. Cl. 280—47.21 **4 Claims**

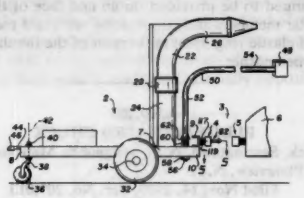
1. An animal cart comprising a box-like body portion of sufficient size to transport a calf and having a gate at one end thereof, a U-shaped supporting yoke pivotally connected to the front of said body portion near the floor thereof, a U-shaped steering and manipulating handle for the cart extending rearwardly thereof for grasping by a walking attendant and including a pair of side arms disposed near and outwardly of the opposite side walls of the body portion and having forward ends connected to said yoke, a pair of ground wheels for the cart journaled between said handle arms and side members of said yoke, and a pair of latches on the rear of said body portion including upwardly opening latching recesses for said handle arms and pivoted keepers which are biased by gravity to active latching positions above said arms when said arms are moved by the walking attendant downwardly into said latching recesses wherein said supporting yoke and said handle are rockable in unison on the axis of said ground wheels to effect raising and lowering of the body portion.

4,349,211

BUMPER HITCH

George N. Cooper, R.R. #1, Site 7, Chase, British Columbia, Canada (V0E 1M0)

Filed Jan. 22, 1979, Ser. No. 5,250
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—481 **11 Claims**



1. A trailer hitch for connecting a trailer to a tractor comprising:

two elongate bumper members, a trailer bumper member connectable to the trailer near one end thereof and a tractor bumper member connectable to the tractor near one end thereof so the trailer bumper member contacts the tractor bumper member when the trailer is connected to the tractor;

a male hitch member pivotally connected to a first said bumper member and extending outwardly therefrom;

a recess in a second said bumper member for receiving the male hitch member;

each bumper member having two ends, the male hitch member and the recess being midway between the ends of the bumper members;

latch means connected to the second bumper member for releasably securing the male hitch member, and

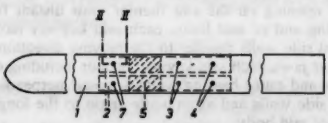
fluid cylinders operatively connected to the latch means for securing or releasing the male hitch member.

4,349,212

HOLDING PLATE, IN PARTICULAR FOR SKI BINDINGS

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Aug. 28, 1979, Ser. No. 70,290
Claims priority, application Austria, Aug. 28, 1978, 6255/78
Int. Cl.³ A63C *5/00*
U.S. Cl. 280—610 **6 Claims**



1. In a ski construction having an electrically conductive base plate, an electrically operable load on a ski binding which is mounted on said base plate, a battery operatively connected to said load to provide the electrical power necessary to effect an operation of said load, the improvement comprising an electrically conductive anchor plate means embedded in said ski and being vertically spaced from and insulated from said base plate, an electrically conductive fastening means for fastening said ski binding to at least one of said base plate and said anchor plate means, said battery having a positive terminal electrically connected to one of said base plate and said anchor

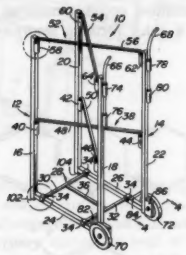
plate means and a negative terminal electrically connected to the other of said base plate and said anchor plate means, said load having at least first and second electrical conductors thereon, said first electrical conductor being electrically coupled to said fastening means, said second electrical conductor being electrically coupled to said other of said base plate and said anchor plate means.

4,349,213

FIREWOOD RACK AND CARRIER

Ronald W. Hirsch, 208 Ellis St., Haddonfield, N.J. 08033

Filed May 19, 1980, Ser. No. 151,086
Int. Cl.³ B62B *1/00*
U.S. Cl. 280—638 **10 Claims**



1. A rigid rack for stacking and supporting firewood comprising:

a pair of upright side frame members for holding firewood therebetween, each frame member having a pair of legs extending upwardly from opposite ends of a bight portion;

a first bracket means having open spaces, said first bracket means attached to the bight portions of said frame members for holding said bight portions in fixed spaced relation and providing a horizontal support for a first stack of firewood;

a second bracket means having open spaces and comprised of at least two elements, said second bracket means being attached to said frame members between the ends of said frame members for holding each leg of each frame member in fixed spaced relation to each other thereby defining an upper limit for a lower compartment for said first stack of firewood therebelow and providing a horizontal support for a second stack of firewood thereabove; and

a third bracket means having open spaces and comprised of at least two elements, said third bracket means being attached to said frame members adjacent the upper ends of said frame members for interconnecting and holding each leg of each frame member in fixed spaced relation to each other thereby defining an upper limit for an upper compartment for the second stack of firewood therebelow.

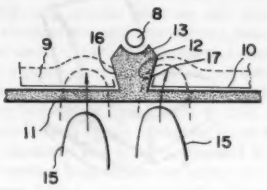
4,349,214

KNEE PROTECTOR

Hideho Inasawa, and Hideoki Matsuoka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 5, 1980, Ser. No. 118,824
Claims priority, application Japan, Feb. 21, 1979, 54-22207[U]
Int. Cl.³ B60R *21/04*
U.S. Cl. 280—752 **6 Claims**

1. A knee protector for use in a passenger car equipped with an instrument panel and a steering colum installed near the instrument panel, comprising first and second curved panels made of material easily crushed as compared with the steering column, the first and second panels being independent and separate to each other, the steering column being aligned with a space between the first and second panels, the first and second panels being mounted under the instrument panel, and a pad made of material that absorbs shock by deformation of the pad, the pad having a pair of side portions covering the upper portion of the first and second panels, the pad having a center portion protruding through said space and extending downwardly along the underside of the portion of the steering column behind the first and second panels in a manner that, in the event of collision, the center portion of the pad first abuts



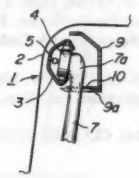
against the steering column and both the first and second panels are deformed while remaining separate from the steering column so that the knees of a driver are guided by the pad and move toward the first and second panels and away from the steering column, said center portion of the pad having diverging side walls and converging upper and lower walls, the upper wall being positioned closely adjacent the steering column when the pad is arranged in position.

4,349,215

COVERING STRUCTURE OF A GUIDE RAIL FOR A SEAT BELT

Hideoki Matsuoka, Yokohama, and Yoshinobu Kondo, Kosai, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Fuji Kiko Co., Ltd., Tokyo, both of, Japan

Filed Feb. 1, 1980, Ser. No. 117,442
Claims priority, application Japan, Feb. 5, 1979, 54-13972[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **1 Claim**



1. A covering structure for a guide rail provided on an inner wall of a vehicle body and having an opening for slideably receiving therein a slide member connected to a seat belt, comprising: a cover and covering means normally closing said opening of said guide rail but opening the same when said slide member moves therein, said covering means being formed by yarn-like bodies extending horizontally from a lower edge of said cover.

4,349,216

FLOATING LOCK MOUNT FOR A SEAT BELT RETRACTOR

Regis V. Pilarski, Utica, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

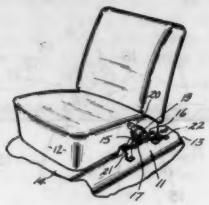
Filed Sep. 22, 1980, Ser. No. 189,949
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—807 **6 Claims**

1. A floating mount for a seat belt retractor serving an adjustable seat:

an elongate track for securing to a vehicle floor adjacent an

adjustable seat and having lock means thereon for substantially its entire length;

a retractor frame supporting said retractor and including a track mount portion slidably mounted on said track and including a lock engaging element normally spaced apart from said lock means on said track;



a resilient coupling secured to said retractor frame and having a seat securing portion for connection to an adjustable automotive seat; and

a fulcrum between said track and retractor frame and upon which said retractor frame tilts upon sudden lifting force whereby said lock engaging element is lifted into lock engagement with said lock means on said track.

4,349,217

DEFLECTION FITTING FOR A SAFETY BELT

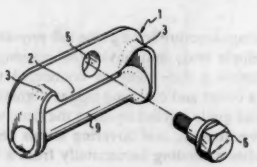
Artur Föhl, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,474

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905862

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—808 **9 Claims**



1. Deflection fitting for a safety belt, comprising a U-shaped deflection fitting bracket formed of a sheet metal strip having edges formed along the length thereof, said U-shaped bracket defining two end portions, a middle portion and corners between said middle portion and end portions, said edges being rounded at least at said corners, a rounded belt deflection bar extending from one end portion of said bracket to the other, and means for fastening said middle portion of said bracket to a vehicle frame, said middle portion having a bend formed therein from one of said edges to the other across the width of said bracket for accommodating said fastening means.

4,349,218

COPYING MATERIAL EMPLOYING FLUORAN COLOR FORMERS

Robert Garner, 20 Tor Avenue, Greenmount, Bury, Lancashire BL8 4HG, England, and Jean C. Petitpierre, Aeussere Reben 322, 4303 Kaiseraugst, Switzerland

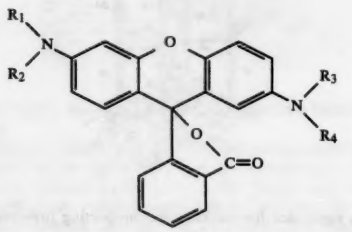
Division of Ser. No. 944,219, Sep. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 822,477, Aug. 8, 1977, abandoned, which is a continuation of Ser. No. 670,780, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 471,269, May 20, 1974, abandoned. This application Oct. 3, 1979, Ser. No. 81,407

Claims priority, application United Kingdom, May 21, 1973, 24079/73

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **8 Claims**

1. A pressure-sensitive copying material containing a support coated with a color forming fluoran compound of the formula



wherein R_1 and R_2 represent alkyl of 1 to 4 carbon atoms, R_3 represents n-alkyl of 8 to 12 carbon atoms and R_4 represents hydrogen, n-alkyl of 6 to 12 carbon atoms or benzyl.

4,349,219

WELDING MUFF OF THERMOPLASTIC MATERIAL

Werner Sturm, Hägendorf, Switzerland, assignor to Von Roll A.G., Switzerland

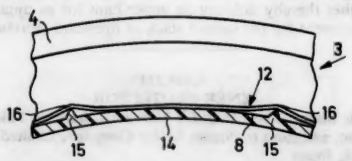
PCT No. PCT/CH79/00054, § 371 Date Dec. 21, 1979, § 102(e) Date Nov. 28, 1979, PCT Pub. No. WO79/00961, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 19, 1979, Ser. No. 177,762

Claims priority, application Switzerland, Apr. 21, 1978, 4344/78

Int. Cl.³ F16L *47/02*

U.S. Cl. 285—21 **10 Claims**



1. An electric welding muff for joining thermoplastic line elements, comprising

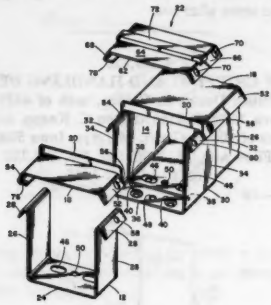
a cylindrical welding sleeve formed of thermoplastic material; and

an electrical resistance heating wire wound in a plurality of turns following a generally circular course and forming a helix coaxial with said sleeve, said turns being embedded in said sleeve adjacent a lateral surface thereof and having peripherally spaced deformation points diverging from said circular course of said turns.

4,349,220
RAINTIGHT WIREWAY

James C. Carroll, Hamilton, Ohio, and Donald L. Chapman, Liberty, Ind., assignors to Square D Company, Palatine, Ill.

Filed Aug. 28, 1980, Ser. No. 182,304
Int. Cl.³ F16L 45/00
U.S. Cl. 285—121 19 Claims

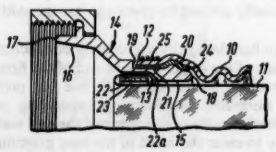


1. A gangable raintight wireway assembly comprising:
a plurality of U-shaped troughs each having a bottom wall for end to end engagement and side walls for end to end engagement with a respective wall of the other trough, said side walls forming side legs which terminate in upper edges,
a trough cover for each trough having a top wall and longitudinal edges, said top wall extending between said side legs and a drip hood flange along each longitudinal edge of said top wall extending outwardly and downwardly from said top wall to a position below the upper edge of said side walls,
an end flange for each cover transverse to said drip hood flanges and extending upwardly from said top wall and outwardly beyond the edges of said top wall to a position below the upper edge of said side walls for facing a flange on an adjacent cover and for preventing the entrance of water into a respective trough between ends of said cover,
a connector cover having a top wall overlappingly engaging adjacent cover end portions with said top wall having drip hood flanges each overlapping engaging end portions of adjacent drip hood flanges of adjacent covers and an upwardly extending boss in said cover top wall having a recess for receiving the upwardly extending facing flanges of adjacent covers,
and means for securing said connector cover to said trough covers and said troughs.

4,349,221
END FITTING ASSEMBLY FOR A CONDUIT

Roy J. Kirby, Slough, England, assignor to Superflexit Limited, Slough, England

Filed Jan. 9, 1980, Ser. No. 110,611
Int. Cl.³ F16L 39/02
U.S. Cl. 285—149 4 Claims

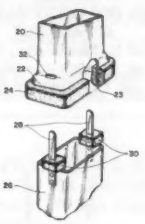


1. A conduit and end fitting assembly, comprising a plastic tube, a coaxial tubular screen spaced radially inwardly of the said plastic tube and substantially concentric therewith, said end fitting having a first end portion comprising means for removably connecting the said assembly to a mating fitting and having a tubular portion of smaller diameter than said first end portion disposed between end portions of said screen and of said plastic tube, said tubular portion of the end fitting being integral with said first end portion of the fitting through an annular shoulder and terminating in an opposite end, a radially outwardly projecting annular bead on said tubular portion between said shoulder and said opposite end, said plastic tube being disposed about said tubular portion and abutting against said shoulder, a gasket disposed between said tubular portion and said plastic tube, means compressing said gasket between the plastic tube and said tubular protion to form a fluid tight seal, said tubular portion having an annular recess in its surface opposite said shoulder, and a sleeve disposed in said recess with its inner surface disposed on the screen and one of said ends of the screen folded over the external surface of the sleeve forming an interference fit in said recess.

4,349,222
PNEUMATIC DUCT CONNECTION

Masaru Takasaki, Yokohama, and Keiichiro Imatomi, Fuji, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 23, 1980, Ser. No. 199,885
Claims priority, application Japan, Oct. 25, 1979, 54-148026[U]
Int. Cl.³ F16L 21/02
U.S. Cl. 285—363 3 Claims



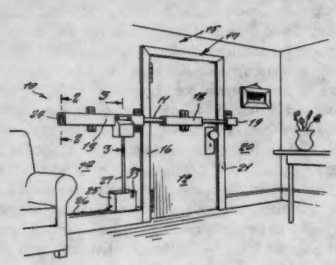
1. A pneumatic duct comprising:
a first conduit having an enlarged diameter receiving portion formed at one end thereof and an aperture formed in said receiving portion;
a second conduit having an external diameter smaller than the internal diameter of said receiving portion, said second conduit being telescopically inserted into said receiving portion;
a bendable strip fixed to said second conduit to project beyond the end thereof, said strip and aperture being adapted so that upon insertion of said second conduit into said receiving portion said strip projects through said aperture and thereafter is bent to connect said first and second conduits;
a soft resilient sealing block disposed on said strip which abuts the inner surface of said receiving portion to seal said aperture and limit the axial movement of said first and second conduits relative to each other; and
a soft resilient sealing member disposed about the mouth of said receiving portion for sealing the gap therebetween and limiting the radial movement of said second conduit with respect to said first conduit.

4,349,223

BURGLAR PROOF BOLT

Nancy R. Spector, 75-11 188th St., Flushing, N.Y. 11366

Filed Jul. 25, 1980, Ser. No. 172,285
Int. Cl.³ E05C *19/00*
U.S. Cl. 292—259 R 1 Claim



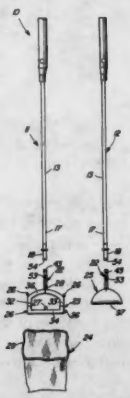
1. A burglar-proof bolt assembly, comprising in combination, a first bracket affixed on a wall inside a home at one side of an entry door, a second bracket affixed on a wall at an opposite side of said door, and a third bracket secured to an inner side of said door, said brackets being aligned, and a bolt stored in said first bracket being slidable through said second and third brackets so as to secure said door from an intruder outside; an electric motor mounted on said wall to which said first bracket is affixed said motor being connected to an electric power of said home, a gear driven by said motor engaging a toothed rack along said bar; and a remote control unit carried by a resident when outside of said home, said remote control unit including means to activate said motor for sliding said bolt and lock or unlock said door.

4,349,224

ANIMAL WASTE COLLECTING AND DISPOSING APPARATUS

Ted M. Shiozaki, 5349 N. Meade Ave., Chicago, Ill. 60630

Filed Jun. 18, 1980, Ser. No. 160,665
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BA 23 Claims



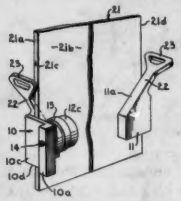
1. Apparatus for collecting and disposing of animal waste comprising elongated handle means having a handle portion and a working end portion, said working end portion having a socket, frame means carried at said working end portion and having a stem insertable into said socket, said frame means being adapted to receive and retain a bag for collecting animal waste, means coacting with said stem for releasably retaining the latter engaged with the socket in said working end portion of said handle means, and ejecting means in said working end portion for ejecting the stem of said frame means from said socket when said releasable retaining means releases said stem, whereby said frame means, said collecting bag and its contents can be simultaneously disengaged and ejected from said working end portion so that a user of said apparatus does not have to touch said frame means or said collecting bag in order to dispose of the same after use.

4,349,225

SHEET GRIPPING AND HANDLING DEVICE

Darryl L. Collins; Donna L. Collins, both of 4631 S. Norfolk Way, Aurora, Colo. 80015; Merton C. Knapp, and Evalyn L. Knapp, both of 108 S. Grant, Mt. Ayr, Iowa 50854

Filed Aug. 26, 1980, Ser. No. 181,732
Int. Cl.³ B66C *1/48*
U.S. Cl. 294—16 18 Claims



1. A device for gripping and lifting the straight, vertically positioned edge of a rigid, substantially rectangular sheet or panel which is being held in substantially vertical orientation, with two substantially parallel side edges thereof in substantially horizontal position and two substantially parallel end edges thereof in substantially vertical position, comprising, in combination:

a first, normally vertical wall operative to abut against and frictionally engage a first zone of one side face of the panel adjacent one end edge thereof,

a normally substantially vertical end wall operative to abut against said one of the said sheet end edges,

the first and end walls connected at right angles to one another to form an L shaped structures in plan view with the inboard faces of said walls being next to one another and said walls having upper and lower ends thereto,

an off-center, cylindrical cam pivotally mounted on a shaft carried by the said end wall at substantial right angles thereto and spaced away from said first wall adapted to substantially non-penetratingly, frictionally engage a second zone of the other side face of said panel also adjacent said end edge in opposition to said first wall engagement,

said cam pivotable around its axis from a position upwardly spaced away from said first wall downwardly to a position spaced closer thereto to engage, in cooperation therewith, the first and second zones of said side faces of the panel therebetween,

stop means on the end wall below the cam limiting its pivot downwardly over top dead center relative to said first wall in a position where the cam is substantially in its closest possible approach to said first wall,

resilient means on said device normally biasing the cam downwardly around its pivot against the said stop means, and

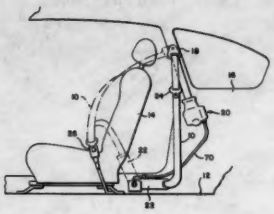
a rigid loop handle rigidly and closely connected at its lower end to one of the upper inboard end of the first wall and an upper portion of the end wall, the top portion of said handle normally horizontal in operating position and spaced backwardly of the plane of the end wall outer face, whereby to clear the hand of the user gripping the handle from the end edge of the panel gripped, yet provide a horizontal, positive grip closely adjacent the engagement and the end edge of the panel or sheet.

4,349,226

SEATBELT SYSTEM

Eiichi Kinaga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 13, 1980, Ser. No. 149,473
Int. Cl.³ A47C 15/00; B65N 75/48
U.S. Cl. 297—475 10 Claims



1. A seatbelt system for securing the safety of an occupant of a vehicle by restraining the occupant in an emergency of the vehicle, which comprises:

a frame;

a take-up shaft which is axially supported by said frame fastened to the vehicle body, and winds up one end of an occupant restraining seatbelt;

a first spring coupled at one end to said take-up shaft which generates a force on the take-up shaft to wind-up the belt;

a gear wheel supported axially by the frame, and to which the other end of the said first spring is anchored;

a second spring having a force larger than the said first spring with one end anchored to the gear wheel and the other end anchored to the frame, whereby said second spring generates a larger winding-up force than the first spring for the take-up shaft to wind-up the belt;

an anchor plate to which a part of the occupant restraining belt is anchored, said anchor plate being in a first position when the belt is not applied to the occupant and being in a second position during the application of the belt to the occupant; and

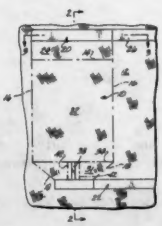
a locking device which prevents rotation of said gear wheel when said anchor plate is in said second position, whereby during the application of the seatbelt to the occupant, only the weak acceleration of the first spring is transmitted to the take-up shaft thereby to reduce the feeling of pressure on the occupant.

4,349,227

MINING SYSTEM FOR IN SITU OIL SHALE RETORTS

William D. Langford, Clifton, Colo., assignor to Occidental Oil Shale, Grand Junction, Colo.

Continuation of Ser. No. 67,921, Aug. 20, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 234,014
Int. Cl.³ E21C 41/10
U.S. Cl. 299—2 24 Claims



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in a retort site in a subterranean formation containing oil shale, such an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:

excavating an upper level void in such formation adjacent an upper portion of the retort site, the upper level void providing access to substantially the entire horizontal cross section of the fragmented mass being formed;

excavating a lower level drift in such formation adjacent a lower portion of the retort site;

excavating an undercut in a lower portion of the retort site including at least a portion at elevations above the lower level drift, the undercut opening into the lower level drift and being larger in vertical cross section than the lower level drift, and leaving a zone of unfragmented formation within the retort site above the undercut;

providing one or more vertical blasting holes in the zone of unfragmented formation;

explosively expanding the zone of unfragmented formation in lifts for forming a fragmented permeable mass of formation particles containing oil shale within the retort site, such explosive expansion being carried out by repeating the steps of:

placing explosive in the vertical blasting holes from access provided by the upper level void;

detonating such explosive for explosively expanding such a lift to form at least a portion of the fragmented mass below a portion of the zone of unfragmented formation remaining within the retort site; and

withdrawing formation particles from the fragmented mass through the lower level drift to provide a void space of selected void volume below such a remaining zone of unfragmented formation prior to explosively expanding the next lift, the void volume of said void space being determined by access provided from the upper level void by such a vertical blasting hole extending through such a remaining portion of the zone of unfragmented formation;

establishing a retorting zone within the fragmented mass and advancing the retorting zone downwardly through the fragmented mass for producing liquid and gaseous products of retorting; and

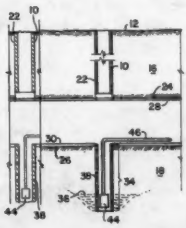
withdrawing the liquid and gaseous products of retorting from a lower portion of the fragmented mass.

4,349,228

METHOD FOR DEWATERING A SUBTERRANEAN FORMATION VIA A BOREHOLE

Edward C. Rohde, Fairmont, W. Va., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Dec. 7, 1979, Ser. No. 101,354
Int. Cl.³ E21C 41/00
U.S. Cl. 299—10 3 Claims



1. A method of installing a perforated casing beneath a subterranean seam of a carbonaceous deposit and mining through the deposit in the area of the casing comprising,

providing a borehole said borehole comprising a seam portion extending through said seam

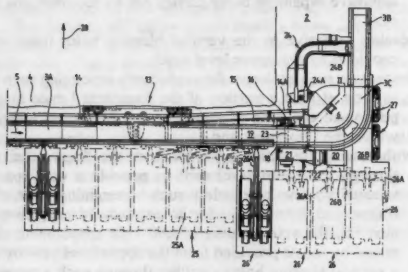
and a lower portion below said seam portion,
providing a perforated casing in said lower portion of said borehole, said casing having a top portion;
providing a packer in said top portion of said perforated casing,
mining said seam, and then removing said packer from said top portion of said perforated casing, providing a pumping means in said perforated casing in said lower portion of said borehole, thereafter pumping water from said lower portion of said borehole.

4,349,229

LONGWALL MINERAL MINING INSTALLATION

Kunibert Becker, Werl, and Herbert Beyer, Wern, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 229,026
Int. Cl.³ E21C *27/34*
U.S. Cl. 299—32 **14 Claims**



1. A longwall mineral mining installation comprising a scraper-chain conveyor having a scraper assembly, a first straight conveyor portion extending along the longwall working, a second straight conveyor portion extending along a roadway positioned at one end of the longwall working, and a curved conveyor section connecting the two straight conveyor portions, a guide assembly for guiding the scraper assembly around the curved conveyor section, a guide fixed to the face side of the first straight conveyor portion, a winning machine reciprocable along the guide, a drive station mounted on the goaf side of the first straight conveyor portion in the region of the curved conveyor section, a drive sprocket rotatably mounted on the face side of the first straight conveyor portion in said region, the drive sprocket driving the winning machine via a drive chain, and a drive shaft drivably connecting the drive station and the drive sprocket, wherein the drive station includes a drive motor whose axis of rotation is substantially parallel to the longitudinal axis of the first straight conveyor portion, and the guide is angled away from the first straight conveyor portion in said region.

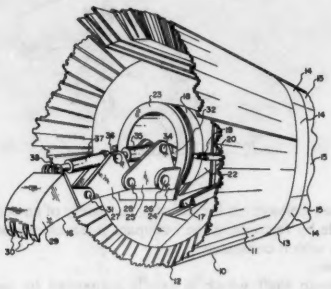
4,349,230

TUNNEL BORING MACHINE

Herman Hamburger, Geneva, and Robert G. Dillingham, Bolingbrook, both of Ill., assignors to Zo[illegible]or Corporation, Aurora, Ill.

Filed Aug. 10, 1979, Ser. No. 64,162
Int. Cl.³ E21D *9/08*
U.S. Cl. 299—33 **8 Claims**

1. In a tunnelling machine of the type including a hollow shield having a cross section substantially the same as that of the tunnel in which an articulated excavator is mounted, the improvement comprising; a non-rotatable outer housing means mounted to said shield for longitudinal movement therein,
bearing means supported by said outer housing means and having an open center aligned with said outer housing means,
an inner housing means mounted on said bearing means for rotation about a longitudinal axis of said shield,
said inner housing means having excavator mounting means on its forward portion and a rearward portion extending through said bearing means and into said outer housing means, boom cylinder mounting means located at the rearward portion of said inner housing means,



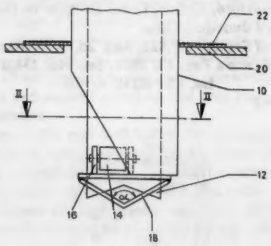
excavator means including a boom means and bucket means pivotally mounted on said excavator mounting means for pivotal movement about an axis transverse to the longitudinal axis of said shield,
boom cylinder means for articulating said excavator means having its forward portion pivotally mounted on said boom means and extending rearwardly through the open center of said bearing means and having its rearward portion pivotally connected to said boom cylinder mounting means at the rearward portion of said inner housing means.

4,349,231

CHISEL ALIGNMENT UNIT FOR A CRUST BREAKING FACILITY

Edwin Gut, Steg; Erwin Arnold, Venthone; Gottfried Maugweiler, and Hans Friedli, both of Steg, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 5, 1980, Ser. No. 184,481
Claims priority, application Switzerland, Sep. 10, 1979, 8149/79
Int. Cl.³ C25C *3/00*
U.S. Cl. 299—69 **11 Claims**



1. Chisel alignment unit for a facility to break open the crust of solidified electrolyte on an electrolytic cell which comprises:
(a) a chisel having at least one flat, vertical alignment surface and an underside;
(b) a mechanically stable alignment box extending from the underside of the chisel in its non-working position wherein said chisel passes through said alignment box;

(c) at least one alignment roll having a horizontal longitudinal axis secured to the alignment box and engaging the alignment surface; and

(d) an electrolyte wiper mounted on the alignment box below the alignment rolls and extending across the whole width of said alignment surface and operative to prevent the crust from coming between the chisel and alignment roll,

wherein said unit is operative to align and guide said chisel and prevent rotation thereof.

4,349,232

TRENCH HEWING TOOL ASSEMBLY WITH CUTTER GUARD ATTACHMENT

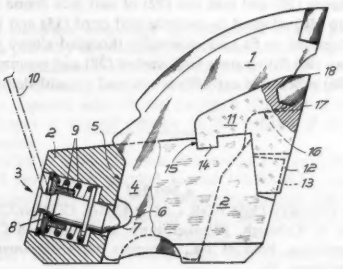
Ernst Braun; Gert Braun, both of Essen-Heisingen, and Karl-heinz Wetzchewald, Essen-Kettwig, all of Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,438

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950108

Int. Cl.³ E21C *35/18*

U.S. Cl. 299—92 **6 Claims**



1. A trench hewing tool assembly comprising:

a cutting blade holder having a shank receiving opening and at least one retaining recess;

a cutting blade having a shank disposed in said shank receiving opening, said shank having an inclined wall recess with an inclined wall on one side of said shank;

said cutting blade having a cutting edge member connected thereto facing in a hewing direction;

a tapered clamping bolt connected to said cutting blade holder extending into said inclined wall recess and bearing against said inclined wall of said cutting blade shank for retaining said cutting blade in said shank receiving opening;

said cutting blade holder having a projection extending therefrom spaced from said cutting blade; and

a guard member having a lateral legs straddling said projection and at least one claw engaging said retaining recess of said cutting blade holder, said guard member having a locking groove receiving said cutting blade.

4,349,233

METHOD AND APPARATUS FOR CONTROLLING WHEEL SLIP ON DIFFERENTIALLY MOUNTED WHEELS

David E. Bullard, Washington, and Allen D. Myers, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00538, § 371 Date May 7, 1980, § 102(e) Date May 7, 1980, PCT Pub. No. WO81/03151, PCT Pub. Date Nov. 12, 1981

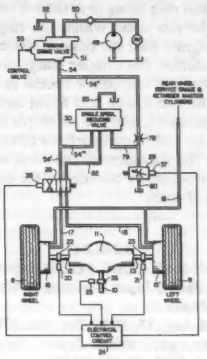
PCT Filed May 7, 1980, Ser. No. 245,231

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—96 **12 Claims**

1. In an anti-slip apparatus for balancing the power transfer between a pair of driven wheels (8), (9) when one of the wheels loses traction and rotates faster than the other, said apparatus having braking means (15) for braking the wheels (8), (9) and generating means (20), (21), (24) for generating a slip signal corresponding to any difference in the rotational speeds between the wheels (8), (9), wherein the improvement comprises:

hydraulic actuating valve means (28), (30) for individually actuating said braking means (15) to minimize any rotational speed difference between the wheels (8), (9), said



actuating valve means (28), (30) being connected to a source of hydraulic pressure (49) and to said braking means (15); and,

hydraulic modulating valve means (29) for modulating said actuating valve means (28), (30) in response to the slip signal to proportionally vary the braking force individually applied to the wheels (8), (9) by the actuating valve means (28), (30).

4,349,234

WEAR RESISTANT WHEEL FOR ENDLESS TRACK

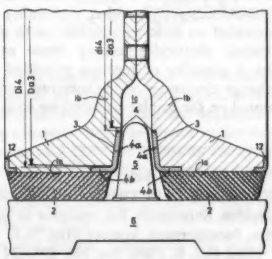
Ewald Hartmann, Cologne, Fed. Rep. of Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 914,188, Jun. 12, 1978, abandoned, which is a continuation of Ser. No. 724,973, Sep. 20, 1976, abandoned. This application Dec. 20, 1979, Ser. No. 105,499

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541776

Int. Cl.³ B62D *55/12*

U.S. Cl. 305—56 **3 Claims**



1. A wheel specifically for use with an endless track vehicle which wheel operates with a toothed track having a plurality of teeth, said wheel comprising:

first and second spaced rims each having a cylindrical tire supporting surface and a depending inwardly extending flange, wherein the flanges have opposed spaced apart portions which form a radially opening slot into which the

teeth of the toothed track are received, each of the flanges having a radially positioned recess extending partially into said spaced apart portions and opening into the slot, the recesses joining the cylindrical tire supporting surface to form a circular shoulder.

a unitary, wear resistant ring heat shrunk onto each of said rims; each ring including a cylindrical portion connected at a juncture to an annular flange portion, the cylindrical portion of each ring being heat shrunk over the cylindrical surface of the rim upon which the ring is mounted and extending slightly past the edge of the cylindrical surface before termination; the annular flange portion of each ring nesting within the respective recess in the spaced apart portion of the rim flange and being heat shrunk into engagement therewith, and the junctures between the cylindrical portions and flange portions of the rings being heat shrunk over the shoulders of the rims, said flange portion extending substantially parallel to the extent of said teeth of the toothed track.

4,349,235

CATHODE-RAY TUBE SOCKET SUBSTRATE

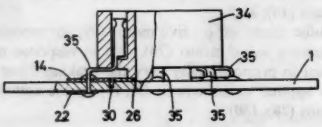
Satoshi Makara, Fukui, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 15, 1980, Ser. No. 178,684

Claims priority, application Japan, Aug. 23, 1979, 54-116479[U]; Sep. 3, 1979, 54-122346[U]

Int. Cl.³ H01R *13/652*

U.S. Cl. 339—14 T **5 Claims**



1. A cathode-ray tube socket substrate comprising an insulation substrate, a plurality of through holes provided in predetermined locations on the insulation substrate, a plurality of terminal electrodes provided at least on one face of the insulation substrate so as to encircle the through holes, a cathode-ray tube socket mounted on the insulation substrate with its terminals extending beyond the reverse side of the socket body being inserted into the respective through holes and securely connected to the respective electrodes around said through holes, cathode-ray tube peripheral circuits composed on the insulation substrate and connected to the required pin terminals of the cathode-ray tube socket respectively, earth electrode mounted on the surface of the insulation substrate where the terminal electrodes are provided, a plurality of discharge electrodes provided so as to oppose the earth electrode and required terminal electrodes among those encircling the through holes, a plurality of recesses provided between the opposed discharge electrodes on the substrate, and a sheathing member mounted on the insulation substrate so as to cover the recesses.

4,349,236

WEATHERPROOF ELECTRICAL JACK ASSEMBLY

Ronald H. Guelden, Shreveport, La., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 6, 1980, Ser. No. 194,424

Int. Cl.³ H01R *13/52*

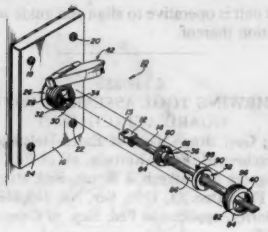
U.S. Cl. 339—44 M **5 Claims**

1. An electrical jack assembly (10) adapted to receive a modular telephone plug (12) and cord (14) characterized in

a jack frame (26) having an externally threaded cylindrical sleeve (28) internally defining a substantially rectangular jack opening (30), said sleeve (28) also having at least one slot (32) positioned on one side of said opening (30);

a grommet means (36) for sealing said jack opening (30) when said modular plug (12) and cord (14) is inserted, said grommet means (36) seating on the end of said sleeve (28) and having a slot (64) corresponding to said slot (32) within said jack frame (26);

a washer (38) adapted to encircle said cord (14), and washer (38) including a projection (86) arranged and dimensioned



to permit entry through said slot (64) of said grommet means (36) and said slot (32) of said jack frame (26); and

a cap (40) adapted to encircle said cord (14) and internally threaded to fit said externally threaded sleeve (28), said cap (40) fitting over said washer (38) and grommet means (36) when said cap (40) is screwed on said sleeve (28).

4,349,237

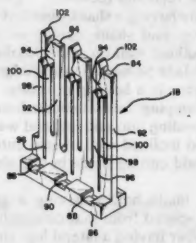
GUIDE SYSTEM FOR CARD EDGE CONNECTORS

Robert F. Cobaugh, Elizabethtown, and Norwood C. Graeff, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 25, 1980, Ser. No. 172,334

Int. Cl.³ H01R *13/20*; H05K *7/14*

U.S. Cl. 339—65 **1 Claim**

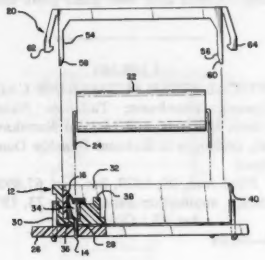


1. A guide system for guiding cards into a card edge connector and for removably retaining them therein, said device comprising, a pair of card guides positioned on each end of a card edge connector, said guides including of a base extending upwardly therefrom a unit consisting of first and second, spaced apart posts defining therebetween a slot for receiving a side of a circuit card, a flexible latch member extending upwardly from the base along side the second post on the side opposite the slot and having a nose extending across the top of the second post and the slot, and further, a third post connected to and horizontally offset from the first post and extending upwardly therefrom, said third post being adapted, in cooperation with the nose on the latch member, to channel the card into the slot and the latch member being adapted to be resiliently cammed away from the slot to admit the card thereinto and to removably latch the card therein by the nose being received in an opening which may be in the card.

4,349,238
INTEGRATED CIRCUIT PACKAGE CONNECTOR

Robert L. Showman, Hershey, and Patrick F. Yeager, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 5, 1980, Ser. No. 204,122
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—75 M **10 Claims**



1. An electrical connector for integrated circuit packages having a plurality of parallel, spaced leads depending from at least one side thereof, said connector comprising:

a housing defining a cavity with a channel formed in each of two opposite sides of said cavity, a plurality of terminal passages in spaced relation in the bottom of each said channel;

a plurality of terminals each mounted in a respective one of said passages in parallel spaced relationship, each said terminal having a contact arm lying against one wall of said channel and a resilient spring arm normally aligned with and spaced from said contact arm;

an insert member received in each said channel, each said insert member having a plurality of cavities each receiving a respective terminal therein, each said cavity having a lead opening providing an access to said terminal;

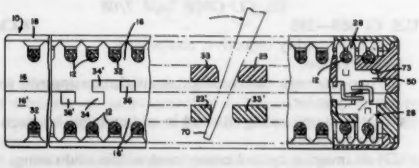
hold down means for holding said insert members in said housing while allowing limited relative movement of the insert members within the housing; and

an actuating cover member having a pair of spaced depending sidewalls each having a cam surface on a free end thereof, said cam surfaces engaging said insert members to cause relative sliding movement of said insert members with respect to said housing whereby said movement of said insert members causes said insert members to drive said spring arms of said terminals into engagement with leads of a package received in said connector.

4,349,239
LOW MATING FORCE CONNECTOR FOR CONNECTING GROUPS OF WIRES

Lincoln E. Roberts, Dunedin, and Henry G. Wasserlein, Jr., Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 3, 1980, Ser. No. 165,528
Int. Cl.³ H01R *4/24*
U.S. Cl. 339—97 R **4 Claims**



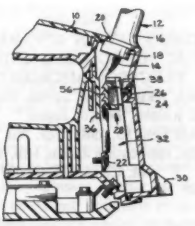
1. A multi-contact electrical connector of the type comprising a generally rectangular dielectric housing having a wire receiving face and an opposed mating face and laterally opposed sidewalls and endwalls bounding said faces, a plurality of stamped and formed contact terminals mounted in and extending through said housing, each of said terminals having a wire receiving portion on said wire receiving face and a mating portion on said mating face, said connector being mateable with a complementary connector comprising a complementary housing by mating said mating face of said housing against a complementary mating face of said complementary housing, characterized in that the housing of said connector is identical to the housing of said complementary connector, each said housing having aligning means comprising an L-shaped latch arm integral with each said side wall and extending normally of said mating face, each said latch arm extending partially over an adjacent recess in said sidewall, said latch arms being positioned to fit into a recess in the complementary housing when said mating faces are guided toward each other substantially normally of the planes of said mating faces to a partially mated position in which said housing and said complementary housing are against, but offset from, each other, said latch arms being thereafter interlocked by guiding said housing and complementary housing by movement of said housings parallel to said mating faces into aligned relationship,

said mating portions of said terminals lie adjacent to but offset from mating portions of terminals in said complementary housing when said housings are in said partially mated position, said mating portions of said terminals being engageable with complementary mating portions of terminals in said complementary housing upon relative movement of said housings from said partially mating position to said fully mated position.

4,349,240
APPLIANCE STRAIN RELIEF

Benjamin H. Bain, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,726
Int. Cl.³ H01R *13/585*
U.S. Cl. 339—103 R **7 Claims**



1. In a portable electric appliance cord connected to internal electric terminals by multiple conductors, an improved strain relief assembly between the cord and appliance comprising,

a housing chamber in the appliance at the cord entrance,

a cover over said chamber enclosing the conductors,

a formed pocket in said chamber having a straight rear wall as part of said housing,

a non-parallel sloped wall as part of said housing spaced from the rear wall,

a boss in said pocket formed on the rear wall extending toward the sloped wall defining a pair of spaced conductor channels and an anchor to secure said cover,

a separate barbed wedge-shaped member fitting between said pocket walls straddling the boss and slidable in said channels,

means adjustably securing and aligning said wedge between the cover and rear wall to said boss

whereby the barps clamp the conductors in the channels with a tightening force by said wedge member between

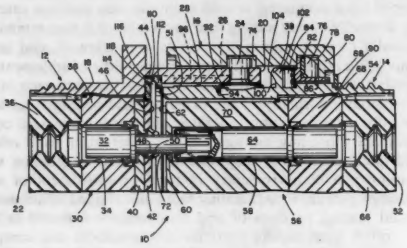
the walls providing strain relief between the cord and terminals.

4,349,241

ELECTRICAL CONNECTOR ASSEMBLY HAVING ENHANCED EMI SHIELDING

Mitchell A. Juris, and Vladimir Tomsa, both of Chicago, Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 9, 1980, Ser. No. 148,422
Int. Cl.³ H01R *13/658*
U.S. Cl. 339—143 R **14 Claims**



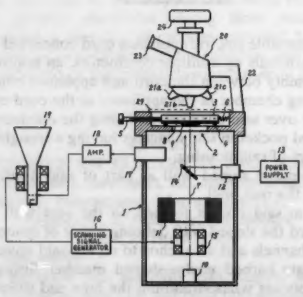
1. An electrical connector assembly comprising:
a separable pair of connector members, each of said connector members having an electrically conductive shell;
means for coupling said connector members in mating engagement, said coupling means having means for resiliently urging said connector shells together; and
means for providing a continuous electrically conductive seal between said connector shells to shield against electromagnetic interference, including a sharp circumferential sealing edge on one of said connector shells, said circumferential sealing edge facing the other one of said connector shells and engaging an annular surface of said other shell to provide continuous circumferential abutment and electrical contact between said connector shells.

4,349,242

SPECIMEN OBSERVATION APPARATUS INCLUDING AN OPTICAL MICROSCOPE AND A SCANNING ELECTRON MICROSCOPE

Kazumichi Ogura, Akishimashi, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,175
Claims priority, application Japan, Feb. 15, 1982, 55-17967[U]
Int. Cl.³ G02B *21/00*
U.S. Cl. 350—81 **5 Claims**



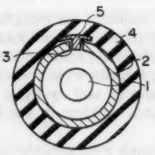
1. In a specimen observation apparatus comprising a vacuum column, an optical microscope, a transparent glass plate having a transparent and electrically conductive layer on a surface thereof for supporting a specimen at a specimen position, means for illuminating the specimen position with light and an electron beam along the same optical axis in said vacuum column to create an optical microscope image with the light passing through the specimen and a scanning electron microscope image based on information obtained by scanning the electron beam over the specimen, the improvement comprising said glass plate being movably disposed near the optical axis at one end of the vacuum column and with a vacuum seal member sealing the column from the atmosphere, said optical microscope being located near said glass plate external to said column.

4,349,243

OPTICAL FIBER SUBMARINE CABLE

Kitsutaro Amano, Yokohama; Taiichiro Nakai, Fujisawa; Masanori Sato, Machida, and Makoto Nunokawa, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Aug. 20, 1979, Ser. No. 67,893
Claims priority, application Japan, Aug. 23, 1978, 53-101732
Int. Cl.³ G02B *5/16*
U.S. Cl. 350—96.23 **6 Claims**



6. An optical fiber submarine cable comprising: an optical fiber; a tubular external pressure resisting layer disposed around said optical fiber, said tubular external pressure resisting layer having a seam extending along the length of said optical fiber and defined by a pair of unconnected confronting edges of said tubular external pressure resisting layer, and said pair of confronting edges of said tubular external pressure resisting layer abutting under external pressure applied to the optical fiber submarine cable; an outer waterproof layer covering and contacting said tubular external pressure resisting layer for holding said pair of confronting edges in their confronting positions and for preventing fluid from entering the optical fiber submarine cable through the seam of said tubular external pressure resisting layer; and a tape-like element disposed on said tubular external pressure resisting layer and extending along and covering the seam of the external pressure resisting layer, wherein a respective one of said tape-like element and said tubular external pressure resisting layer having a cross section effective for preventing said tape-like element from being displaced on the surface of said tubular external pressure resisting layer.

4,349,244

HIGH QUALITY OBJECTIVE USING AIR BEARING

Walter Hellriegel, Jena-Neulobeda, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Apr. 23, 1980, Ser. No. 142,922
Int. Cl.³ G02B *7/04, 7/08*
U.S. Cl. 350—255 **5 Claims**

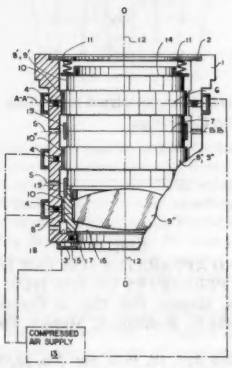
1. A high quality objective, comprising
(A) a cylinder,
(B) two retainers, each retainer situated at an opposite end of said cylinder,
(C) at least one casing situated in said cylinder between said two retainers,
(D) an imaging optical component within said casing,
(E) a ring-shaped air chamber between said cylinder and said casing, of minimum width at a center circumferential line

of said casing and of maximum width at an end of said casing,

(F) a plurality of radial air inlets in said cylinder arranged equidistantly from one another, each air inlet directed to the center circumferential line of said casing,

(G) a plurality of radial air outlets in said cylinder, arranged equidistantly from one another and axially spaced from said air inlets (F),

(H) a compressed air supply engaged with said air inlets (F) and air outlets (G) to balance the optical component (D) with respect to an optical axis of said objective,



(I) elastic means disposed between one of said retainers (B) and an end of a casing (C) within said cylinder (A),

(J) an intermediate air chamber disposed within said cylinder between said other retainer and an end of a casing opposite the end contacting said elastic means and engaged with said ring-shaped air chamber (E), and

(K) a plurality of air inlets disposed within said latter retainer (J) concentrically around a body axis of said cylinder (A) equidistantly from one another, and engaged with said compressed air supply on one side of said latter retainer (J) and with said intermediate air chamber (J) on the other side of said latter retainer (J).

4,349,245

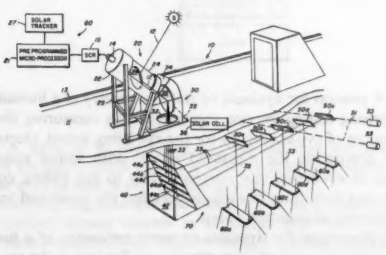
MODULAR NATURAL LIGHTING SYSTEM

Arthur W. Kliman, Beverly, Mass., assignor to Baird Corporation, Bedford, Mass.

Filed Jan. 29, 1981, Ser. No. 229,633

Int. Cl.³ G02B *17/00*

U.S. Cl. 350—264 **10 Claims**



1. A modular natural lighting system comprising:

(a) a microprocessor-controlled heliostat tracker structure equatorially mounted on the roof of a building to track the sun;

(b) a cold dielectric mirror structure mounted on said roof in operative association with said heliostat tracker structure to receive the sun's rays reflected therefrom in a manner so as to reflect only the visible solar radiation thereof;

(c) an aperture provided in both said cold dielectric mirror structure and said roof;

(d) a distributor structure, including at least one glass plate mirror configured to be planarly adjustable, said structure operatively mounted below said aperture so as to receive said reflected visible solar radiation from said cold dielectric mirror structure and reflect and focus selective portions thereof;

(e) a plurality of reflectors mounted throughout said building, each of which is designed to receive a selective portion of said visible solar radiation reflected by said distributor structure; and

(f) a plurality of output stations mounted throughout said building in operative association with said plurality of reflectors and designed to receive portions of said visible solar radiation reflected by said plurality of reflectors and to provide natural illumination in selected areas of said building.

4,349,246

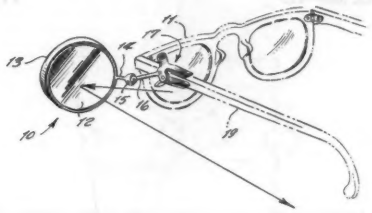
REAR VIEW MIRROR WITH SLIT CLIP ATTACHMENT

Tihamer S. Binner, 304 West Point Ave., Somerset, N.J. 08873

Filed Nov. 17, 1980, Ser. No. 207,752

Int. Cl.³ G02B *7/18*; G02C *7/14, 9/04*

U.S. Cl. 350—298 **1 Claim**



1. A rear view mirror for personal use, comprising in combination, a mirror in a frame, an arm affixed to said frame, a pivotable stem on an end of said arm and a support means on an end of said stem for support from a garment or other object such as eyeglasses or the like being worn by a person; a ball and socket joint between said arm and said stem for adjustment of said mirror; said mirror being of wide view type; and said support means on an end of said stem comprising a clip having a pair of spring-loaded tongues for being clasped around upper and lower sides of an eyeglasses temple bar or the like; each said tongue being slit on its end with slits so as to form fingers for grasp around cylindrically rounded surfaces.

4,349,247

MIRROR APPARATUS FOR AUTOMOBILE

Yukio Koyama; Tsutomu Kondo, both of Yokohama; Mikio Matsuzaki, Hadano, and Kunio Akizuki, Saitama, all of Japan, assignors to Mitsubishi Motors Corp. and Ichikoh Industries Ltd., both of Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,907

Claims priority, application Japan, Jul. 31, 1979, 54-104883[U]; Jul. 31, 1979, 54-104884[U]; Jul. 31, 1979, 54-104885[U]

Int. Cl.³ B60R *1/08*

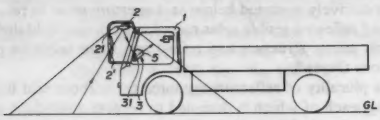
U.S. Cl. 350—302 **10 Claims**

1. A mirror apparatus for automobile, comprising an objective mirror region having a convexed curved objective mirror and a planar ocular mirror region having a planar ocular mirror, wherein:

said objective mirror is provided to face an area of ground

surface centering around the vicinity of that corner within a driver's chamber located opposite to the driver's seat,

said ocular mirror is provided within a space of the ocular mirror region having a first aperture for receiving therethrough an image reflected by said objective mirror and a



second aperture for transmitting therethrough to the driver an image reflected by said ocular mirror, and

said first aperture has such a limited size as is required for receiving the image from said objective mirror region that is reflected by said objective mirror.

4,349,248

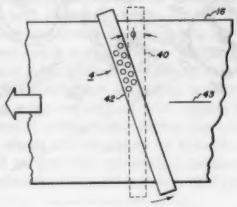
GRADIENT INDEX LENS ARRAY WITH IMPROVED EXPOSURE UNIFORMITY

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 23, 1980, Ser. No. 142,921

Int. Cl.³ G02B *3/00*; G03B *27/10, 27/72*

U.S. Cl. 350—413 **5 Claims**



1. In an optical imaging system, a plurality of gradient index fibers arranged in a lens array, said lens array positioned between an object and image plane,

means for illuminating said object plane,

means for providing relative motion between said lens array and said object and image planes whereby light reflected from at least a portion of an object is transmitted by said lens array so as to imagewise expose a portion of said imaging plane,

said lens array lying in a vertical plane which is transverse, by an angle ϕ greater than zero, to a plane perpendicular to the direction of relative motion of a point on said image plane, passing through said exposure zone.

4,349,249

COMPOUND LENS

Berlyn B. Brixner; Morris M. Klein, and Max A. Winkler, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 21, 1980, Ser. No. 151,995

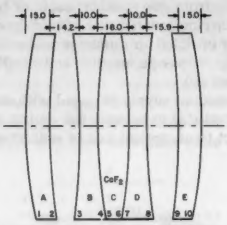
Int. Cl.³ G02B *1/02, 9/22*

U.S. Cl. 350—483 **9 Claims**

1. A compound lens comprising:

at least one optical element comprising calcium fluoride;

at least two optical elements comprising ordinary crown glass having an index of refraction with sodium light between about 1.500 and about 1.540 and an Abbe number of between about 56.5 and about 61.0; and



wherein the secondary spectrum is less than about 1 part in 50,000 in the C-F range.

4,349,250

PROCESS AND APPARATUS FOR THE DYNAMIC OR STATIC PERIMETRY OF THE HUMAN EYE

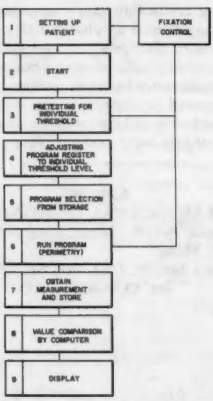
Siegfried Gelius, Munich, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,691

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1978, 2815657

Int. Cl.³ A61B *3/06*

U.S. Cl. 351—32 **18 Claims**



1. A process for dynamic or static perimetry of a human eye comprising testing the eye, topographically measuring threshold values of eye sensitivity for the eye being tested, electronically comparing the measured values with stored standard values of eye sensitivity corresponding to the testing conditions, and indicating deviations between the measured values and the stored standard values.

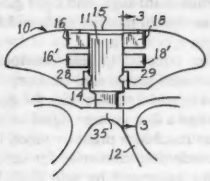
15. Apparatus for dynamic or static perimetry of a human eye comprising perimeter testing means for testing the eye and providing topographically measured threshold values of eye sensitivity for the eye being tested, comparing means for electronically comparing the measured values with stored standard values of eye sensitivity corresponding to the testing conditions, and means for indicating deviations between the measured values and the stored standard values.

4,349,251

ADJUSTABLE EYEGLASS MOUNTING

Sidney Shedrow, 202 E. Gaston St., Savannah, Ga. 31401

Filed Aug. 11, 1980, Ser. No. 177,098
Int. Cl.[3] G02C *5/04, 1/00, 9/00*
U.S. Cl. 351—128 9 Claims



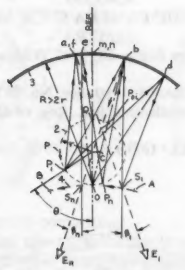
1. Eyeglasses mounting means, wherein attaching means is fixed in a mask and eyeglasses are selectively fixable to said attaching means, said mounting means including a plurality of notch means vertically spaced on said attaching means, a carrier, said carrier having said eyeglasses hinged thereto, at least one tab extending from said carrier for being received by a selected one of said plurality of notch means, said at least one tab including a first tab extending from one side of said carrier and a second tab extending from the opposite side of said carrier, said plurality of notch means including a first plurality of notch means adapted selectively to receive said first tab and a second plurality of notch means adapted selectively to receive said second tab.

4,349,252

STEREOSCOPIC MOTION PICTURE-CIRCULAR TO LINEAR SCAN TRANSLATOR (ALTERNATE SCREEN)-METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Jan. 5, 1981, Ser. No. 222,375
The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.
Int. Cl.[3] G03B *35/00*
U.S. Cl. 352—58 2 Claims



1. A method of recording and reproducing stereoscopic views for observation by plural observers without visual aids at the eyes of said observers, comprising:

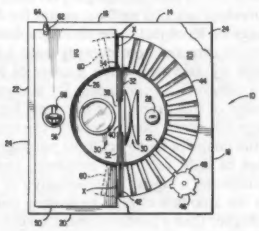
photographing multiple sequential views of a scene from a motion picture camera in a manner such that between each sequential view relative motion takes place between the camera and scene and the optical axis of the camera for the various views is essentially coincident or parallel with each other; reproducing said views sequentially by projecting the views from a scanning projector onto a screen; said scanning projector being positioned, during the projection of successive views, at successive positions about the arc of a projection circle so as to project the images to said screen on the opposite side of said projection circle; said screen being stationary and of larger radius compared with said projection circle and comprised of elementary horizontal corrugated ridges to vertically scatter and horizontally reflect incident light from said projector, said screen having its arc center at a single reference point, said reference point being located on the opposite side of said projection circle center from said screen and on a line bisecting said screen, said line passing through said projection circle center; said scanning projector constrained to project said sequential views toward a common point located on said bisecting line between said projection circle center and said screen; and the scanning of said projector being at a rate sufficient to be within the period of persistence of vision of an observer.

4,349,253

CASSETTE ROTARY TRAY SLIDE PROJECTOR AND SLIDE CASSETTE USABLE THEREWITH

Fernando Alvarez-Sabater, P.O. Box 3628, and Ilio J. Ulivi C., Apartado de Correos 1146, both of C-1010A, Caracas, Venezuela

Filed Dec. 19, 1980, Ser. No. 218,026
Int. Cl.[3] G09F *11/30;* G03B *23/02*
U.S. Cl. 353—112 9 Claims



1. A cassette rotary tray slide projector for projecting slides comprising:

a casing;

a central hub within said casing;

illuminating and projecting means within said central hub for illuminating and projecting slides located in a viewing position defined within said central hub;

slide passage defining means located in said central hub for defining a slide passage having an inlet and an outlet positioned so that slides, under the force of gravity, enter the inlet, pass the viewing position, and leave the slide passage through the outlet;

slide receiving means movable with respect to said central hub for receiving slides from the slide passage outlet and for temporarily storing received slides;

a slide cassette separate from said slide receiving means and removably held in a predetermined position in said casing, said slide cassette having a housing and a slide storage tray movable with respect to said housing, said slide storage tray having a plurality of compartments arranged in an arc for receiving and storing slides to be projected;

means having a component carried by one of said slide cassette and said casing for releasably holding said slide cassette housing in a predetermined position in said casing; and

means for moving said slide tray with respect to said housing so that said compartments are moved out of said housing into said casing and sequentially aligned with the inlet of said slide passage whereby slides fall under the force of gravity out of said compartments into the slide passage, pass through the slide passage, and are received in said slide receiving means.

4,349,254

CAMERA FOCUS DETECTING DEVICE

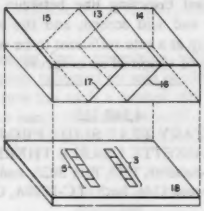
Masao Jyojiki, Tsurugashima, and Harumi Aoki, Kiyose, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 118,057

Claims priority, application Japan, Feb. 13, 1979, 54-15256; Feb. 13, 1979, 54-15257

Int. Cl.³ G03B 7/08

U.S. Cl. 354—25 8 Claims



1. A focus detecting device for a camera comprising: two groups of light receiving elements disposed on the optical axis of a photographing lens in two planes which are parallel to each other with one of said planes lying on each side of a plane optically equivalent to a film surface; means for dividing a light flux of an image on an object to be photographed into a plurality of light fluxes directed continuously onto a light receiving surface formed by said respective groups of light receiving elements on a substrate; circuit means for analyzing outputs of said two groups of light receiving elements for detecting the amount of high frequency components in the spatial frequency spectrum of the image of an object to be photographed on each of said groups of light receiving elements; and a processing circuit for producing a signal representative of correct focalization when the amounts of high frequency components thus detected are higher than a predetermined level and are equal to each other.

4,349,255

PHOTOGRAPHING APPARATUS FOR AN ENDOSCOPE

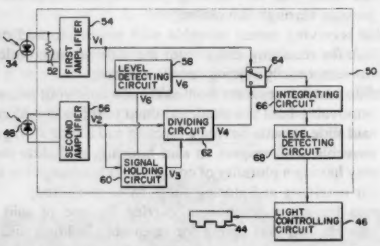
Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,635

Claims priority, application Japan, Mar. 14, 1980, 55-32361

Int. Cl.³ G03B 7/08

U.S. Cl. 354—31 5 Claims



1. A photographing apparatus for an endoscope comprising:

an endoscope having a light guide for transmitting light to a region to be photographed, and an image guide for transmitting light reflected from the region to be photographed;

a flash light source for emitting light for photographing into the light guide of said endoscope;

a camera unit for housing a film to which is projected a light beam transmitted through the image guide of said endoscope, said camera unit having shutter means disposed in the optical path of the light beam for opening and closing the optical path of the light beam, and further having means for generating a synchronous signal for opening the shutter means;

a first photoelectric converter for detecting part of the light beam transmitted through said light guide;

a resistor connected in parallel with said first photoelectric converter;

a first amplifier coupled to said resistor for amplifying a voltage generated across said resistor;

means coupled to said first amplifier for generating a switching signal when a first voltage signal amplified by said first amplifier has reached a predetermined level;

a second photoelectric converter for detecting part of the flash of light generated by said flash light source, and across which no resistor is coupled;

a second amplifier coupled to said second photoelectric converter for amplifying a voltage generated by said second photoelectric converter;

correction signal generating means coupled to said second amplifier for holding the level of a second voltage signal amplified by said second amplifier in response to said switching signal and for generating a correction signal obtained by amplifying the second voltage signal of said level by a constant factor;

means coupled to said second amplifier and to said correction signal generating means for generating a divided signal obtained by dividing said second voltage signal generated by said second amplifier by said correction signal;

integrating means for integrating a supplied signal;

switching means for switching the signal supplied to said integrating means from said first voltage signal to said divided signal in response to said switching signal;

means coupled to said integrating means for generating a flash-terminating signal when the output from said integrating means reaches a predetermined level; and

means for energizing said flash light source in response to a synchronous signal and for deenergizing said flash light source in response to said flash-terminating signal.

4,349,256

PHOTOGRAPHIC CAMERA SUCH AS A REFLEX CAMERA

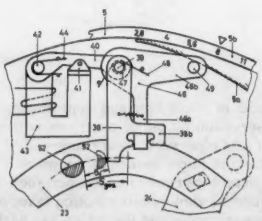
Franz Starp, Mittlere Steige 36, 7547 Wildbad 5, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,900

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951006

Int. Cl.³ G03B 7/085, 9/06, 9/07

U.S. Cl. 354—43 10 Claims



1. Photographic camera apparatus, such as a reflex camera, comprising

objective means incorporating an electrodynamically drivable diaphragm aperture blade system,

circuit means for controlling the operation of the diaphragm

blade system and adapted to operate in dependence upon sensed ambient light, and

selector means associated with the circuit means and adjustable to a manual mode MAN and at least one automatic mode AUTO, which when adjusted to the manual mode MAN operatively permits the diaphragm blade system to be adjusted to a manually preselected aperture width and which when adjusted to the at least one automatic mode AUTO operatively permits the diaphragm blade system to be automatically adjusted to an aperture width adjusted in dependence upon sensed ambient light,

said diaphragm blade system including a driving member operatively arranged for adjustment movement and which is controlled by the circuit means and adapted for actuating the diaphragm blades in accordance with such adjustment movement, and which has operatively associated therewith an electromagnetically actuatable path limiting stop,

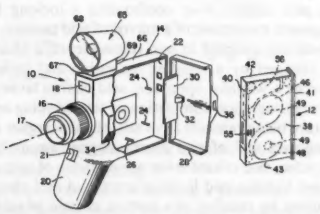
said stop being operatively positioned at a basic inactive location stop position which is variable relative to the driving member by means of a manually actuated diaphragm aperture width preselector for adjusting the stop to a stop position corresponding to the manually preselected diaphragm aperture width, and which stop, when the selector means are adjusted to the manual mode MAN, becomes operative and is controlled by the circuit means for actuation to an active location stop position for terminating operatively the adjustment movement of the driving member at said stop position in accordance with the manually preselected diaphragm aperture width, but which, when the selector means are adjusted to the at least one automatic mode AUTO, becomes inoperative.

4,349,257

CAMERA HAVING A SELECTED PATTERN OF PRE-EXPOSURE FOR FINAL EXPOSURE CORRECTION

Melvin Friedman, Sudbury, and William A. Holmes, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 3, 1981, Ser. No. 231,124
Int. Cl.³ G03B *15/03, 17/00*
U.S. Cl. 354—126 **11 Claims**



1. Camera apparatus comprising:

means for locating photographic film at a given focal plane;

means for transmitting image-forming light rays along an exposure path from a photographic scene to said focal plane for exposing film thereat, said transmitting means defining a given camera acceptance angle and having an optical axis;

means for providing artificial illumination of the photographic scene, said illumination providing means producing a predetermined non-uniform illumination pattern over the scene area defined by said acceptance angle such that there is a difference in illumination between at least a first and a second portion of said scene area; and

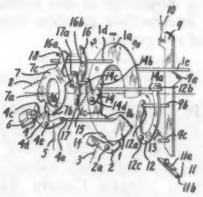
supplemental illumination means for directing filtered non-uniform supplemental illumination along a path other than the exposure path to only one section of said focal plane corresponding to the one of said scene portions having the lower predetermined illumination to reduce the difference in level of exposure of said first and second portions anticipated as a result of said non-uniform illumination.

4,349,258

MANUAL FOCAL POINT ADJUSTING AND CHANGE-OVER DEVICE FOR USE IN AUTOMATIC FOCAL POINT ADJUSTER CAMERA

Kiyoshi Kitai; Masaru Kobayashi; Tadashi Nakagawa; Hiroaki Ishida; Masanori Watanabe, and Yuzuru Takazawa, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 961,871, Nov. 17, 1980, abandoned. This application Aug. 11, 1980, Ser. No. 177,186
Claims priority, application Japan, Nov. 18, 1977, 52-138730; Nov. 18, 1977, 52-138731; Nov. 18, 1977, 52-154879
Int. Cl.³ G03B *3/00, 15/03, 17/18*
U.S. Cl. 354—127 **14 Claims**



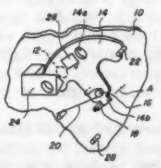
1. A lens focal point adjusting and mode change-over device for a camera having automatic lens focal point adjustment, comprising: change-over means manually operable for changing a camera operating mode between automatic focusing and manual focusing, said change-over means including a manually positionable member manually positionable at a position for operating a camera in an automatic focusing mode and manually positionable over a range of positions for operating a camera in a manual focusing mode and at a camera lens focal point setting determined by the position of said manually positionable member; and means for restricting a position of a positionable camera lens in response to a signal representative of a distance between an object and the camera lens, said restricting means cooperating with said change-over means for operating to allow automatic focusing of the camera lens when said change-over means is set for automatic focusing, and said restricting means being rendered inoperative by said change over means when said change-over means is set for manual focusing, thereby to allow focusing by positioning of said manually positionable member of said change-over means.

4,349,259

EXPOSURE CONTROL MECHANISM FOR USE WITH CHEMICAL FLASH

James W. Meyer, Fairport, and John E. Mooney, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,362
Int. Cl.³ G03B *15/03, 9/26*
U.S. Cl. 354—135 **4 Claims**



2. In a photographic camera of the type using chemical

flashlamps, an exposure control mechanism for covering and uncovering an exposure aperture in synchronism with the peak output of a flashlamp, comprising:

a primary shutter blade mounted for pivotal movement back and forth from a rest position wherein said primary shutter blade covers the exposure aperture, through an intermediate position, wherein said primary shutter blade uncovers the exposure aperture, to a rebound position;

spring means for urging said primary shutter blade toward said rest position;

drive means for causing said primary shutter blade to move from said rest position to said rebound position;

flash firing means for igniting a chemical flashlamp substantially simultaneously with the start of movement of said primary shutter blade; and

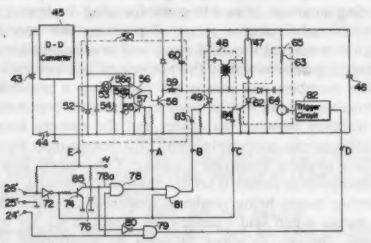
auxiliary shutter blade means for covering the exposure aperture during movement of said primary shutter blade through said intermediate position from said rest position to said rebound position, and for uncovering said exposure aperture during movement of said primary shutter blade through said intermediate position from said rebound position to said rest position.

4,349,260

AUTOMATIC ELECTRONIC FLASH DEVICE PRODUCING PRELIMINARY FLASH LIGHT AND PRIMARY FLASH LIGHT

Tokuji Ishida, Daito, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1980, Ser. No. 220,290
Claims priority, application Japan, Dec. 31, 1979, 54-171489
Int. Cl.³ G03B *15/05*; H05B *41/26*
U.S. Cl. 354—145 **12 Claims**



1. An automatic electronic flash device for use with a camera which performs T.T.L light measurement while stopping down a diaphragm and which includes means for arresting said diaphragm when the value of the light measurement represents a given relationship with respect to a reference signal, said flash device comprising:

a pair of synchronizing contacts receiving a synchronizing signal from corresponding synchronizing contacts on said camera when a camera shutter is fully opened;

a first signal contact receiving a preliminary flash control signal, which at least controls by its trailing edge the timing of termination of the production of the preliminary flash light, from a corresponding signal contact on said camera before receipt of said synchronizing signal at said synchronizing contacts, said first signal contact also receiving a primary flash stop signal, which terminates the production of the primary flash light, from said corresponding first signal contact on said camera after receipt of said synchronizing signal at said synchronizing contacts;

a control circuit connected to said synchronizing contacts and said first signal contact for passing said preliminary flash control signal without said synchronizing signal having been received at said synchronizing contacts and for passing said primary flash stop signal with said synchronizing signal having been received at said synchronizing contacts;

means for producing a primary flash light in response to said synchronizing signal received at said synchronizing contacts;

means for terminating the production of said primary flash light by said primary flash light producing means in response to said primary flash stop signal having passed through said control circuit; and

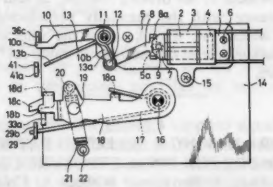
means for producing a preliminary flash light whose intensity is relatively low and substantially constant, said preliminary flash light producing means being responsive to the trailing edge of said preliminary flash control signal having passed through said control circuit for the termination of the production of said preliminary flash light.

4,349,261

ELECTROMAGNETIC RELEASE DEVICE FOR SINGLE LENS REFLEX CAMERA

Hiroshi Kurei, Kasagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1981, Ser. No. 227,561
Int. Cl.³ G03B *9/08, 19/12*
U.S. Cl. 354—152 **7 Claims**



1. An electromagnetic release device for a single lens reflex camera comprising: an armature; an electromagnet assembly including a permanent magnet, a yoke magnetically coupled to said permanent magnet and a coil would on said yoke, said armature being adapted to be attracted and retained by said electromagnet; a release lever coupled to be rotated by said armature, said release lever confronting a locking lever for locking upward movement of a mirror of said camera; a release spring elastically coupled to said release lever; a charge lever which is charged by a winding operation and locked upon completion of a winding operation, said charge lever abutting said release spring upon completion of said winding operation; said armature being released from said electromagnet assembly by exciting said coil of said electromagnet assembly with a electrical pulse, said release lever upon release of said armature abutting and kicking said locking lever, and said charge lever being restored by running of a bottom curtain of said camera which is effected when a photographing operation is ended whereupon the force of said release spring is eliminated.

4,349,262

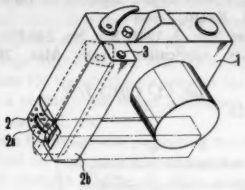
AUTOMATIC FILM WINDING DEVICE HAVING A MOVABLE GRIP MEMBER

Yoshitaka Watanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1980, Ser. No. 211,723
Claims priority, application Japan, Nov. 29, 1979, 54-154731
Int. Cl.³ G03B *19/04, 1/18*
U.S. Cl. 354—173 **10 Claims**

10. An automatic winding device for a camera adapted to be operatively mounted on a camera body to perform a winding operation comprising a main body part adapted to be connected to said camera body and a grip member including release means operably connected with said main body part and mounted to be movable relative thereto to a plurality of differ-

ent positions, said automatic winding device further comprising fixing means provided between said main body part and



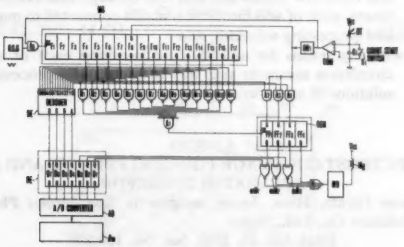
said grip member for fixing said grip member at a desired angle relative to said camera.

4,349,263

EXPOSURE TIME CONTROL DEVICE FOR CAMERA

Masanori Uchidoi, Yokohama, and Kazunobu Urushihara, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1980, Ser. No. 144,981
Claims priority, application Japan, May 8, 1979, 54-56538
Int. Cl.[3] G03B *9/62*
U.S. Cl. 354—234 1 Claim



1. An electrical exposure time control device for a camera having a shutter, comprising:

(a) first timing means for forming a given time interval;

(b) second timing means for forming a compensation time interval;

(c) means for maintaining the opening of said shutter for a total time interval of the given time interval and the compensation time interval so that the shutter is opened for a desired exposure time; and

(d) control means for shortening the given time interval formed by the first timing means by a predetermined time interval so as to be shorter than the desired exposure time;

said first timing means including:

(a) a main counter for dividing the frequency of an input pulse signal;

(b) a presettable counter for counting the frequency divided pulse signal from the main counter and for storing data related to the desired exposure time;

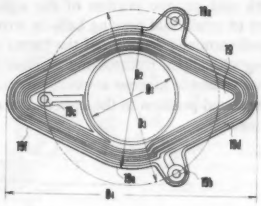
(c) detecting means for applying a shutter closing signal to the maintaining means when the presettable counter has counted pulses corresponding to the data stored in the presettable counter.

4,349,264

ELECTROMAGNETICALLY DRIVEN SHUTTER

Nobuo Tezuka, Tokyo, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1981, Ser. No. 231,040
Claims priority, application Japan, Feb. 8, 1980, 55-15414
Int. Cl.[3] G03B *9/22*
U.S. Cl. 354—234 3 Claims



1. An electromagnetically driven shutter, comprising:

shutter blades;

a shutter driving rotor for operating said shutter blades, said shutter driving rotor having a circular opening centered at the optical axis of a photograph-taking lens and having circumferential parts concentric with said circular opening and straight parts extending in tangential directions of said circumferential parts, said driving rotor being formed in an approximately rhombic shape in such a manner than angles formed by said straight parts will not be angles of ninety degrees;

a conductor coil provided along a periphery of said shutter driving rotor; and

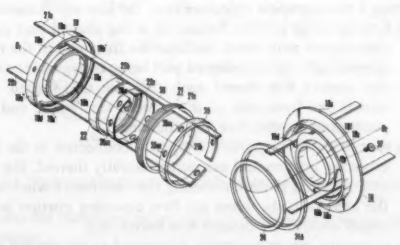
magnets for generating magnetic fluxes which cross orthogonally the conductor coil and are parallel with the optical axis of the photograph-taking lens, said magnetic fluxes operating on the straight parts of said conductor coil.

4,349,265

SUPPORT STRUCTURE FOR THE APERTURE SIGNAL TRANSMITTING MEANS IN A CAMERA LENS ASSEMBLY

Kazufumi Kobayashi, Tokyo, and Shigeru Hashimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,646
Claims priority, application Japan, Dec. 17, 1979, 54-174487[U]; Dec. 17, 1979, 54-174488[U]
Int. Cl.[3] G03B *17/00, 9/02;* G02B *7/02*
U.S. Cl. 354—286 11 Claims



6. A support structure for signal transmitting means in a lens assembly comprising:

a signal transmitting member having an axially elongate portion and an annular portion, said annular portion forming a groove for holding bearing balls;

barrel means constituting a part of said lens assembly, said barrel means having holes formed therein in a circular pattern about the optical axis of said lens assembly; and

retainer members which are inserted in said holes of the barrel means for retaining said bearing balls at a predetermined positions about the optical axix, said retainer members being fixed at said barrel means by being inserted into said holes, with contact portions of said retainer members contacting said bearing balls being so made as to cooperate with said groove portion of the signal transmitting member to retain said bearing balls in a rotatable manner at a predetermined position of the barrel means, thereby retaining said signal transmitting member by the bearing ba'ls in a rotatable manner about the optical axis and at a predetermined position in the optical axis direction at the barrel means.

4,349,266

LENS CAP FOR A CAMERA

Keisuke Maeda; Keiji Takechi, both of Sakai, and Tetsuro Oya, Osaka, all of Japan, assignors to Minolta Camera KK, Osaka, Japan

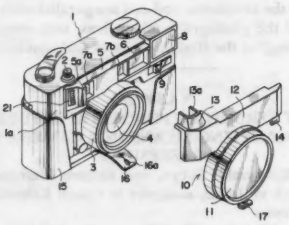
PCT No. PCT/JP80/00197, § 371 Date Nov. 19, 1980, § 102(e) Date Nov. 19, 1980, PCT Pub. No. WO81/00624, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 26, 1980, Ser. No. 224,568

Claims priority, application Japan, Aug. 30, 1979, 54-119956[U]

Int. Cl.³ G03B *11/04, 17/02*

U.S. Cl. 354—295 **22 Claims**



1. A lens cap for use with a camera which includes a camera body having a viewfinder window, a manually-operable member extending outwardly of the camera body and a lens barrel extending outwardly of the camera body, the lens barrel containing a photographic objective lens, the lens cap comprising

a first covering portion formed of a ring-shaped part and a disc-shaped part which encloses the front end of the ring-shaped part, the ring-shaped part being engageable around the camera lens barrel such that the disc-shaped part covers the front end of the camera lens barrel and the photographic objective lens therein,

a second covering portion integrally connected to the first covering portion and extending laterally thereof, the second covering portion covering the viewfinder window of the camera body when the first covering portion is engaged around the camera lens barrel, and

a protective means integrally connected to the second covering portion, the protective means surrounding at least three sides of the manually-operable member to prevent manual operation thereof when the first covering portion is engaged around the camera lens barrel,

the first and second covering portions and the protective means being integrally molded of a plastic material.

4,349,267

PROCESSING SOLUTION CIRCULATING DEVICE FOR FILM PROCESSOR

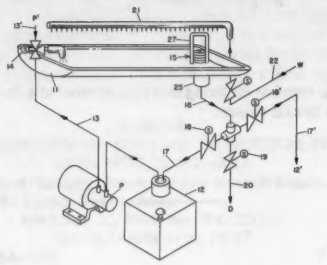
Masami Ohtani, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 3, 1981, Ser. No. 240,109

Claims priority, application Japan, Mar. 26, 1980, 55-40836[U]

Int. Cl.³ G03D *3/06*

U.S. Cl. 354—323 **7 Claims**



1. A device for circulating at least two processing solutions through a tray comprising:

reservoir means for separately containing said processing solutions;

overflow means mounted on an opening on the bottom of said tray and including means for variably positioning said overflow means to control the level of said processing solutions in said tray at a desired level;

at least two circulation means circularly connected between said overflow means and said tray through said reservoir means, each of said circulation means connected to one of said processing solutions; and

switching means for selectively connecting each of said circulation means to said tray to supply said processing solutions to said tray.

4,349,268

ELECTROSTATIC IMAGE-FORMING PROCESS AND AN APPARATUS THEREFOR

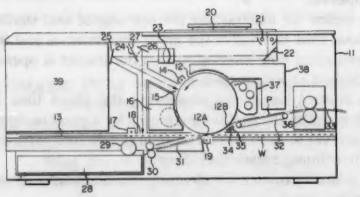
Masao Hirata, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jun. 26, 1980, Ser. No. 163,268

Claims priority, application Japan, Jun. 28, 1979, 54-80780; Jul. 16, 1979, 54-89284; Jul. 16, 1979, 54-89285; Jul. 16, 1979, 54-89286; Jul. 19, 1979, 54-90927

Int. Cl.³ G03G *15/01*

U.S. Cl. 355—4 **22 Claims**



18. An electrophotographic apparatus for forming an electrostatic image of an original having a color portion and a black portion, comprising:

a rotary photoconductive drum member as a first recording material and comprising a peripheral photoconductive layer on a conductive drum surface;

a photoconductive member as a second recording material and disposed for operative movement to a position in which at least a portion of said photoconductive member oppositely faces said first recording material;

a plurality of developing units for developing an electrostatic image formed on the first recording material;

a mechanism for transporting a transfer sheet for receiving thereon a visible toner image developed on said first recording material; and

a mechanism for imagewise projecting the image light from an original on both said first and said second recording materials through a dichroic filter interchangeably disposed with a second filter to separate the image light into a first image light in a color corresponding to one of the colors of the original and a second image light of complementary color to the fist image light;

said first image light being projected on said second recording material along a first light path and said second image light being projected on said first recording material along a second light path.

4,349,269

MANUAL PAPER FEED INHIBITING DEVICE IN ELECTROGRAPHIC COPYING MACHINE

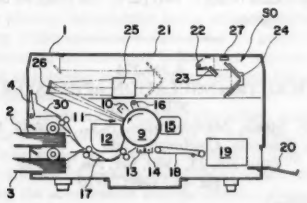
Osamu Okada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1981, Ser. No. 231,573

Claims priority, application Japan, Feb. 15, 1980, 55-18646[U]; Dec. 18, 1980, 55-182698[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **11 Claims**



1. In an electrophotographic copying machine having manual and normal paper feed capabilities, which machine comprises at least one paper supply unit from which a copying paper is automatically supplied towards a processing station, a manual feed means through which a copying paper is manually inserted into the machine, means for forming a thermally fusible powder image on the copying paper, and a heat-fixing device for fusing and fixing the powder image on the copying paper, the improvement which comprises a manual paper feed inhibiting device comprising switching means for causing the temperature of the heat fixing device to be adjusted to one of a plurality of predetermined temperatures in dependence on the thickness of the copying paper; means for inhibiting the manual feed of the copying paper through the manual feed means; and a control means for actuating said inhibiting means during the time the temperature adjustment is being performed in the heat fixing device in response to the switching means, whereby the manual feed of the copying paper by the manual feed means is permitted only when and after the heat fixing device has attained the predetermined temperature in dependence on the thickness of the copying paper.

4,349,270

DEVELOPER REMOVING DEVICE FOR COPYING APPARATUS

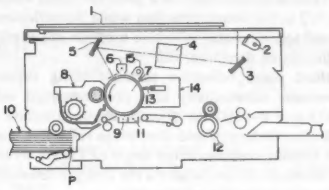
Kenichi Wada; Susumu Tanaka, and Kenji Tabuchi, all of Sakai, Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Sep. 19, 1980, Ser. No. 188,912

Claims priority, application Japan, Oct. 11, 1979, 54-131360

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—15 **12 Claims**



1. In a copying apparatus which includes a photosensitive member on which an electrostatic latent image is to be formed; the combination of a magnetic brush developing means for developing the electrostatic latent image by the use of a developer mix of triboelectrically charged magnetic carrier particles of 5 to 30 microns in average diameter and having resistivity of greater than $10^{12}\Omega$ cm and non-magnetic toner particles of 5 to 25 microns in average diameter and having resistivity of greater than $10^{14}\Omega$ cm; means for applying a biasing voltage to said magnetic brush developing means for giving thereto a potential greater than the potential of the background portion of the latent image but less than the potential of the image portion of the latent image for causing said magnetic carrier particles to transfer onto the background portion of the latent image formed on the photosensitive member; and a developer removing device for removing said magnetic carrier particles adhered on the background portion of said latent image at least either by magnetic force or electrostatic force.

4,349,271

IMAGE PROJECTING SYSTEM

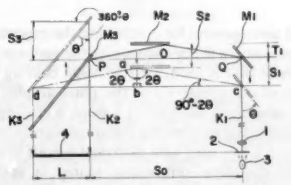
Shiro Toriumi, Zama, and Yutaka Watanabe, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1980, Ser. No. 211,722

Claims priority, application Japan, Dec. 8, 1979, 54-159648

Int. Cl.³ G03B *27/70*; G02B *27/17*

U.S. Cl. 355—60 **6 Claims**



1. An image projecting system which comprises, in combination:

means for stationary supporting an original on a supporting plane;

an image receiving member on which consecutive portions of an image of the original are successively projected through a slit;

means for illuminating the original and carrying the image of the original along an optical path extending from the original to the image receiving member; and

first, second and third plane reflective members disposed on said optical path for guiding the rays of light carrying the

image of the original towards the image receiving member,

said first plane reflective member being supported for movement substantially at a predetermined velocity of $V/2 \sin 2\theta$ in a direction perpendicular to the supporting plane while the reflective surface of said first plane reflective member lies at a first predetermined angle θ relative to the above direction,

said second plane reflective member being supported for movement substantially at a predetermined velocity of V tan $\theta/2$ in the above direction while the reflective surface of said second plane reflective member lies at right angles to the above direction, and

said third plane reflective member being supported for movement substantially at a predetermined velocity of $-V(4 \cos^2 \theta - 1)/2 \sin 2\theta$ in the above direction while the reflective surface of said third plane reflective member lies at a second predetermined angle of $(360° - \theta)$ relative to the above direction, wherein the first predetermined angle θ has the following relationship;

$0° < \theta < 90°$, wherein $\theta \neq 45°$.

4,349,272

CIRCUIT ARRANGEMENT FOR CONTROLLING THE EXPOSURE TIME OF REPRODUCTION CAMERAS

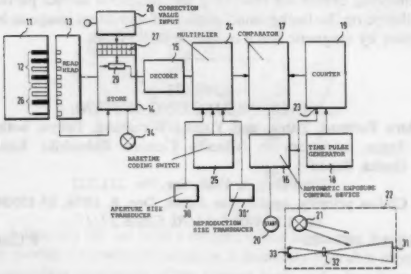
Bernd Holthusen, Hamburg, Fed. Rep. of Germany, assignor to Dr. Böger Duplomat Apparate KG (GmbH & Co.), Fed. Rep. of Germany

Filed Nov. 7, 1980, Ser. No. 204,989

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945166

Int. Cl.³ G03B *7/00, 27/72*

U.S. Cl. 355—69 **7 Claims**



1. A circuit arrangement for controlling the exposure time of a reproduction camera in dependence on the package of photographic material that is used, said package bearing markings characteristic of the sensitivity of the photographic material, the circuit arrangement comprising a store, a reading head for reading said markings to generate electrical signals representative thereof and for passing said electrical signals to said store, a decoder for decoding information stored in said store to produce a decoded signal related to the sensitivity of the photographic material, light source means for the reproduction camera, a switching control device connected to said light source means for switching said light source means on and off, a basic time coding switch for supplying a basic exposure time signal related to the exposure characteristics of the particular reproduction camera, a multiplier for forming an exposure time signal equal to the product of the basic exposure time signal and the decoded signal, a start key connected to said switching control device for initiating the exposure and comparator means connected to terminate the exposure via said switching control device when the time elapse since initiation of the exposure equals said exposure time signal.

4,349,273

ELECTROPHOTOGRAPHIC PRINTER EXPOSURE STATION

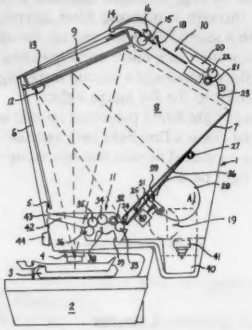
Paul M. James, London, England, assignor to Imaging Technology Limited, London, England

Filed Feb. 26, 1981, Ser. No. 238,583

Claims priority, application United Kingdom, Mar. 5, 1980, 8007497

Int. Cl.³ G03B *27/58*; B65H *9/00*

U.S. Cl. 355—72 **7 Claims**



1. An exposure station in an electrophotographic printer comprising means defining a downwardly inclined support for a copy sheet and stop means for the sheet adjacent to the lower extremity of the support, which stop means is movable between operative and inoperative positions only in the former of which it supports a sheet against sliding down the support, characterised in that the stop means comprises a lower stop means and an upper stop means, the lower stop means being effective in a transverse central region of the support and the upper stop means being in two parts, one lying on each side of said central region.

4,349,274

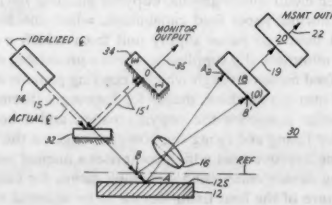
OPTICAL TRIANGULATION APPARATUS AND METHOD

Douglas S. Steele, Mechanicville, N.Y., assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 23, 1980, Ser. No. 171,513

Int. Cl.³ G01C *3/10*

U.S. Cl. 356—1 **8 Claims**



1. In combination with optical triangulation measurement apparatus of the type having a light source positioned to provide a measuring beam directed to a workpiece, the light source having an idealized centerline and an actual centerline with the deviation therebetween introducing a measurement error, a photo detector positioned to receive a portion of the measuring beam reflected from the workpiece with a portion of the reflected measuring beam characterized by being representative of the point of impact of the measuring beam on the

workpiece and wherein the photo detector develops a photo detector output signal representative of the point of impact of the measuring beam on the photo detector, and measurement intelligence means for receiving said photo detector output signal and developing a measurement output signal representative of the point of impact of the measuring beam on the workpiece, wherein the improvement comprises:

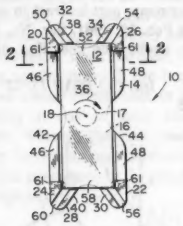
means for monitoring the relationship between the idealized centerline and the actual centerline and developing a monitor output signal representative of the deviation therebetween.

4,349,275

SLIDE HOLDER FOR SPINNER

Gary A. Ayotte, Newtonville; Jules J. Boh, Framingham, and Thomas G. Breen, Fitchburg, all of Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 19, 1980, Ser. No. 160,963
Int. Cl.³ G01N *1/28, 21/34*
U.S. Cl. 356—36 **10 Claims**



1. A method of securing a substrate for spun blood smears in a substrate holder of a spinning apparatus comprising the steps of:

loosely placing the substrate in the substrate holder;

spinning of the substrate holder about its geometric axis by accelerating the substrate holder to a constant rotational speed of spinning and thereafter spinning the substrate at the constant rotational speed;

during acceleration of the substrate holder, employing the inertia of the substrate to slide at least one edge of the substrate under an inwardly-facing overhang portion of one of a pair of locking members to secure the substrate during the acceleration and the constant rotational speed spinning of the substrate holder;

decelerating the substrate holder from its constant rotational speed to a stationary disposition;

during deceleration of the substrate holder, employing the inertia of the substrate to slide the substrate away from said first engaged locking member so that at least one other edge of the substrate slides under an inwardly-facing overhang portion of the other said locking member of said first pair to secure the substrate during the deceleration of the substrate holder.

4,349,276

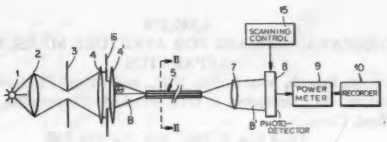
METHOD OF AND SYSTEM FOR DETERMINING REFRACTIVE-INDEX PROFILES OF OPTICAL FIBERS

Pietro Di Vita, Turin, Italy, assignor to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 14, 1980, Ser. No. 208,705
Claims priority, application Italy, Nov. 15, 1979, 69212 A/79
Int. Cl.³ G01N *21/84, 21/41*
U.S. Cl. 356—73.1 **7 Claims**

1. A method of determining the refractive-index profile of an optical fiber having a core with a refractive index within a predetermined range sheathed by cladding with a refractive index near the lower limit of said range, comprising the steps of:

(a) inserting the fiber to be examined into an axially coextensive capillary tube of transparent material with a refractive index less than the lower limit of said range while leaving an annular clearance between said tube and the fiber;



(b) filling said annular clearance with a transparent liquid having a refractive index higher than the upper limit of said range;

(c) illuminating an end of the resulting unit;

(d) photoelectrically scanning the opposite end of said unit to measure the luminous energy emitted along a radius thereof; and

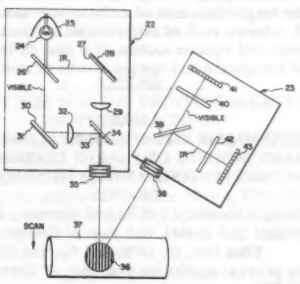
(e) registering the values measured in step (d).

4,349,277

NON-CONTACT MEASUREMENT OF SURFACE PROFILE

Joseph L. Mundy; Gilbert B. Porter, III, both of Schenectady, and Thomas M. Cipolla, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1980, Ser. No. 158,372
Int. Cl.³ G01B *11/00*; G01C *3/20*
U.S. Cl. 356—376 **28 Claims**



20. A system for acquiring surface profile measurements comprising:

an optical sensor for scanning the surface of an object;

said sensor comprising an optical transmitter having a multispectral source of light, a first subsystem for extracting two approximately equal power wavelength bands from the emitted wavelengths of said light source, and a second subsystem for recombining said wavelength bands and for projecting onto the surface a periodic complementary color pattern;

said sensor further comprising an optical receiver for sensing reflected light at a predetermined parallax angle and having a third subsystem for separating said wavelength bands and a pair of detector arrays on which said wavelength bands shift position depending upon the depth from the object surface to a reference, said detector arrays generating a pair of electrical sensor signals corresponding to the detected light intensities of the two wavelength bands; and

a signal processor comprising color pattern decoupling

circuitry for processing said sensor signals and extracting a normalized signal that is substantially independent of surface reflectivity and roughness variations, and means for processing said normalized signal to yield the phase shift between said normalized signal and a reference and hence depth data from which the surface profile can be mapped.

4,349,278

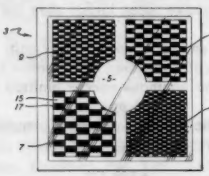
COMPARATOR MASK FOR APERTURE MEASURING APPARATUS

Kenneth French, Merrimack, N.H., and Alfred Piorkow, Lancaster, S.C., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 9, 1980, Ser. No. 158,024

Int. Cl.³ G01B *11/02, 3/34*

U.S. Cl. 356—394 **3 Claims**



1. In apparatus for determining aperture size of slotted apertured material for a color cathode ray tube wherein a comparator mask is employed in conjunction with the apertured material intermediate a light source and light detector to provide optical transmission data, the improvement comprising a comparator mask having a light transparent section and multiple sections of alternate transparent and opaque sectors with each of said sectors having a length less than the length measured along the longitudinal axis of a slot of said slotted apertured material, wherein each of said multiple sections has alternate transparent and opaque sectors of a size different from the alternate transparent and opaque sectors of another section.

4,349,279

METHOD FOR THE COLOR EVALUATION OF PATTERN MODELS OF FABRIC, DECORATION OR PACKAGING PRINTING, AND A COLOR EVALUATION DEVICE

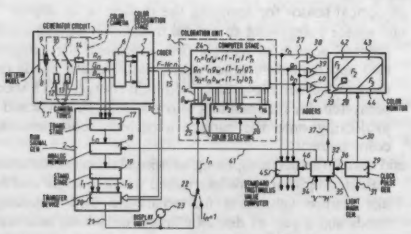
Eggert Jung, Schoenberg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,696

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853509

Int. Cl.³ G01J *3/50*

U.S. Cl. 356—402 **22 Claims**



13. A color evaluation device for evaluating color pattern models for fabric, decoration or packaging printing and the like, in which a signal source generates primary color measuring signals of a pattern model having a plurality of pattern colors and in which a color monitor operates line-by-line to display the pattern model prior to printing the pattern on a printing medium, comprising:

a first circuit connected to the signal source for recognizing the pattern colors and for generating respective color output signals;

a second circuit connected to said signal source for generating a run signal for each pattern color dependent on the color saturation of the respective pattern colors from at least one primary color measuring signal; and

a coloration unit having inputs connected to the first and second circuits and an output connected to the color monitor, said coloration unit being adjustable to selectively assign video color signals to the pattern colors for controlling the color monitor.

4,349,280

CONTINUOUSLY OPERATING MIXER FOR LOOSE OR AND FLOWABLE MATERIAL

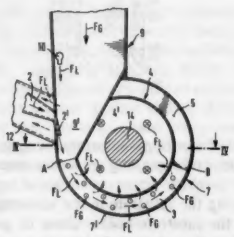
Wilhelm Lödige, Paderborn, Fed. Rep. of Germany, assignor to Fritz Lödige, Paderborn and Josef Lücke, Lichtenau, both of, Fed. Rep. of Germany, part interest to each

Filed Feb. 19, 1981, Ser. No. 236,125

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006438

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—183 **14 Claims**



1. A continuously operating mixer for loose or flowable material, said mixer comprising:

a cylindrical mixing drum, which at a first end region thereof is provided with an inlet opening for material to be mixed, and at a second end region thereof is provided with an outlet for mixed material;

a mixer shaft which rotates in said drum and is provided with mixing instruments;

a feed device located in the vicinity of said first end region of said drum and having an inlet chute, with a lower end segment, for delivering said material to be mixed;

a nozzle-like air inlet channel for guiding a flow of compressed air, said air inlet channel opening into said lower end segment of said inlet chute;

an injection channel, which is directed toward said inlet opening of said mixing drum, said injection channel communicating with said lower end segment of said inlet chute, and with said air inlet channel, for receiving material to be mixed, and compressed air;

means arranged in said injection channel for deflecting incoming material to be mixed toward the axis of said mixing drum;

an air-suction channel which faces away from said inlet opening of said mixing drum, said air-suction channel being flow-connected with said injection channel; and

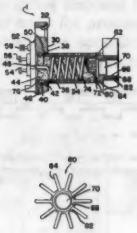
at least one blower associated with said mixing drum for producing an air flow, said air inlet channel, said injection channel, and said air-suction channel being consecutively subjected to the air flow of said at least one blower.

4,349,281

TEMPERATURE SENSOR ASSEMBLY APPARATUS

Peter J. Onksen, Merrimack, N.H., and Leonard Spadafora, North Tewksbury, Mass., assignors to Pacer Systems, Inc., Burlington, Mass.

Filed May 15, 1980, Ser. No. 150,117
Int. Cl.[3] G01K *1/14, 1/16*
U.S. Cl. 374—136 10 Claims



1. Temperature sensor apparatus comprising a base, a heat insulating tube mounted on the base and extending outwardly therefrom, a temperature sensor mounted on the heat insulating tube at a location remote from the base, electrical conductor means extending axially through the heat insulating tube from the temperature sensor to the base in a series of helical loops and terminating at one or more electrical terminals mounted on the base, wherein the heat insulating tube comprises a tubular body having an end mounted on the base and heat insulating material positioned in the tubular body between the base and the temperature sensor.

4,349,282

TRANSDUCERS

Raymond W. Norfolk, Castleford, England, assignor to Spill-Fire Alarm Systems Ltd., London, England

Continuation-in-part of Ser. No. 936,358, Aug. 24, 1978, abandoned. This application Dec. 9, 1980, Ser. No. 214,727
Claims priority, application United Kingdom, Feb. 8, 1977, 5035/77; Apr. 12, 1977, 15004/77
Int. Cl.[3] G01K *7/00*
U.S. Cl. 374—183 10 Claims

5. A temperature monitoring device of the type comprising an elongated, hollow tube having opposite sealed ends defining a chamber therebetween; a pair of electrodes, each at an opposite end of said tube within said chamber, said electrodes forming part of an electrical monitoring circuit and a medium filling said chamber which changes its electric conductivity in response to a change in temperature, characterized by:

said electrodes having non-corrosive tips of platinum;

said tube being formed of flexible black, thin walled, plastic tubing of small bore;

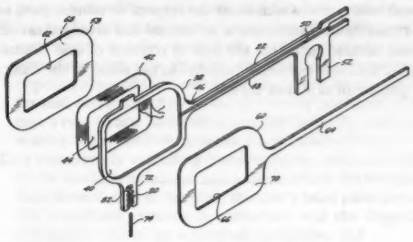
and said medium being an aqueous ionic salt solution saturated with potassium nitrate, normally in liquid state, at −20° C., but subject to abrupt, sudden crystallisation of salts out of said solution in response to a reduction of temperature to thereby trigger said monitoring circuit.

4,349,283

HAMMER FOR DOT MATRIX PRINTER

Thomas P. Sapitowicz, Bel Air, and Robert A. Meloni, Baltimore, both of Md., assignors to General Instrument Corporation

Filed Sep. 5, 1980, Ser. No. 184,311
Int. Cl.[3] B41J *3/12*
U.S. Cl. 400—124 14 Claims



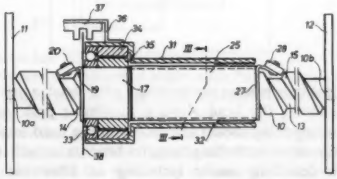
1. A hammer for use in a dot matrix print head, the hammer carrying an electrically energizable coil, adapted to be situated in the magnetic field, and being displaceable relative to the field between a rest position and a print position when the coil is energized, said hammer comprising a coil carrying portion, means for resiliently mounting said coil carrying portion to the head, and a print wire, said coil carrying portion comprising means for mounting said print wire, said print wire mounting means comprising first and second spaced, substantially coplanar sections, partially defining a print wire receiving recess elongated substantially along the direction of displacement, and first and second clamping means defined by a plurality of spaced slots formed in said coil carrying portion, said clamping means extending between said sections and across the recess, said clamping means being situated to engage opposite sides of said print wire and adapted to retain said print wire substantially within the plane of said sections.

4,349,284

ASSEMBLY FOR MOVING PRINTING MEANS OF A PRINTING MACHINE

Leif H. Andersson, Atvidaberg, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed May 5, 1980, Ser. No. 146,597
Claims priority, application Sweden, May 4, 1979, 7903898
Int. Cl.[3] B41J *25/28*
U.S. Cl. 400—320 10 Claims



1. In an office machine having a printing means movable linearly along a recording medium, said printing means being supported by a carrier, a nut member rotatably mounted on said carrier being in driving connection with a fixed lead screw in a manner whereby a rotatable means causes displacement of said carrier along said screw, said rotatable means being drivingly connected to a drive motor mounted on said carrier, and means being rigidly connected to said carrier, said means coacting with a shaft for the guidance of said carrier, said shaft being located substantially parallel to said lead screw, the

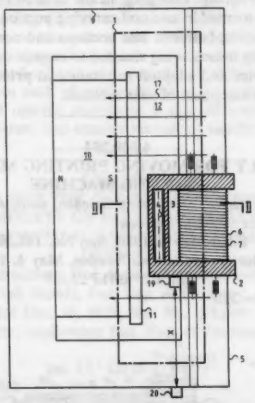
improvement comprising: two tubular parts constituting said nut member and being mounted in interfitting coaxial relation to each other and to said lead screw, said tubular parts having two ends in overlapping relation and two free ends, one of said parts having a radial flange, the other part having the overlapping end bearing on said flange, spring means interconnecting said tubular parts for rotation relative to each other, each of said tubular parts at its free end supporting for rotation a rotatable contact means which bears against the flank of the groove of said lead screw which faces the respective tubular part, and the rotatable contact means is so located and arranged on each of said tubular parts that the axis of rotation of said rotatable contact means is essentially parallel to the plane of the flank of the groove of said lead screw.

4,349,285

PRINTER HAVING ACOUSTIC HEAD LOCATING SYSTEM

Francois Gernelle, Le Chesnay, France, assignor to Compagnie Internationale pour l'Informatique CII Honeywell Bull, Paris, France

Filed Jun. 19, 1980, Ser. No. 161,148
Claims priority, application France, Jun. 19, 1979, 79 15626
Int. Cl.³ B41J *25/28, 19/30*
U.S. Cl. 400—320 **9 Claims**



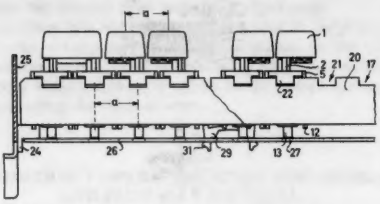
1. A dot type printer comprising a print head, a drive system for translating the head along a rectilinear path, said drive system comprising means for detecting the head location and means for servocontrolling the print head on its path, said head location detecting means including an ultrasonic acoustic transmitter/receiver system, a transmitter of the acoustic system being carried by the print head, the receiver of the acoustic system being fixed to a frame of the printer, the ultrasonic system comprising means for controlling the frequency of a wave derived from the transmitter, said frequency control means including memory means for first and second signals for deriving a difference signal, a digital/analogue converter responsive to the difference signal for deriving a frequency control signal and a voltage controlled oscillator responsive to the frequency control signal for deriving an excitation wave for the transmitter.

4,349,286

KEYBOARD ASSEMBLED FROM INDIVIDUAL KEYS

Paul Blaser; Helmut Schmidt, both of VS-Villingen, and Walter Strobel, Unterkirnach, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,293
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2807061
Int. Cl.³ B41J *5/08*
U.S. Cl. 400—492 **1 Claim**



1. A keyboard assembled from individual keys, comprising:
(a) keys, including
(i) a key button,
(ii) a key shaft having said key button affixed thereto at one end,
(iii) a stationary key body for receiving the other end of said key shaft, and
(iv) a spring for influencing the relative movement between key shaft and key body;
(b) a base structure for receiving said keys, said base structure being provided with cutouts which are arranged with uniform spacing in two dimensions;
(c) a circuit board carrying electrical control elements being disposed on said base structure, said control elements adapted to being switched by operation of said key shafts;
(d) said key buttons having three receiving openings for said key shafts, one of said openings being arranged in the middle and the other two openings being arranged to the left and right thereof, said openings being arranged with respect to each other at a distance of a quarter of the lateral key-to-key spacing; and
(e) said cutouts in said base structure and the arrangement of said control elements on said circuit board being arranged staggered relative to each other by a half spacing from row to row for selective use as alphabetic key sections or as key sections for numerical and function keys wherein said keys may be arranged to be staggered relative to each other from row to row from zero to at least a half spacing at discrete quarter-spaced intervals.

4,349,287

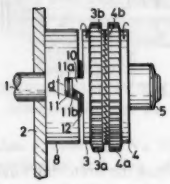
INTERMITTENT PAPER FEED MECHANISM

Yoshinori Chida, and Satoru Tada, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Dec. 19, 1980, Ser. No. 218,185
Int. Cl.³ B41J *19/78;* F16H *27/02*
U.S. Cl. 400—569 **8 Claims**

1. An intermittent feed mechanism comprising: an output shaft rotatably supported by a support plate to undergo rotation about a rotary axis; a driven wheel carried with said shaft so as to rotate together therewith; a driving wheel rotatably and slidably received on said shaft so as to be positioned opposite to and facing said driven wheel, said driving and driven wheels having on their respective facing surfaces thereof a plurality of axially extending ratchet teeth releasably engageable to effect one-way coupling of the driving and driven wheels in a forward direction of rotation, and said driving wheel having a plurality of projections integrally extending from a lateral surface thereof, each projection having a trapezoid shape having one edge extending at a right angle and

another edge inclined with respect to a line normal to the rotary axis; a cylindrical stopper body fixed on said support plate opposite to said driving wheel and having a cylindrical wall portion having spaced therearound a plurality of notches corresponding in number and similar in shape to said projections, said projections being movably inserted in respective ones of said notches and coacting therewith to ensure incremental rotation of the driving wheel through increments corresponding to one pitch of said ratchet teeth of said driving wheel; a coiled return spring disposed between said driving wheel and said stopper body for pressing said driving wheel toward said driven wheel, the opposite ends of said return spring being respectively connected to said stopper body and



said driving wheel for imparting a return force of rotation to said driving wheel in the reverse direction of rotation; and a rotatable detent lever cooperative with a plurality of pawls disposed on the outer peripheral surface of said driven wheel so as to prevent reverse rotation of said driven wheel in the reverse direction; whereby during operation the driving wheel is intermittently advanced in the forward direction through increments corresponding to one pitch of said ratchet teeth thereof through the coaction between said projections and said notches, and said driving wheel is axially urged toward said driven wheel so as to enable said ratchet teeth of said both wheels to engage each other during forward advance of the driving wheel.

4,349,288

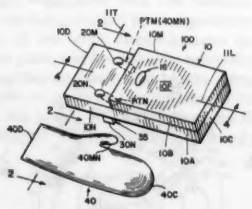
PERSONAL CLEANSING ARTICLE FOR RECTO-GENITAL REGION

Helen I. Bond, 709 Olson Rd., Longview, Wash. 98632

Filed Nov. 10, 1980, Ser. No. 205,740

Int. Cl.³ A47L *13/19;* **A61M** *35/00*

U.S. Cl. 401—7 **21 Claims**



1. Personal cleansing article for the recto-genital region and comprising:

A. a flexible laminar washcloth member extending longitudinally along a central-axis and peripherally defined by a transverse lead-end, a transverse trail-end, and two longitudinally extending cloth-edges, said washcloth member having two opposed broad surfaces including uppersurface and lowersurface, said uppersurface having a finite surface-area and being hydrophilic substantially throughout for aptly contacting the recto-genital anatomy, the washcloth member being adapted to be supported by the palm of the user's outstretched hand, said washcloth member below the uppersurface including a longitudinally extending laminar-pouch, said laminar-pouch having a single pouch-throat relegated to the washcloth member uppersurface whereby hydrophilic cleansing liquid is chargeable into and is expelled from said laminar-pouch through said single pouch-throat, said cleansing liquid being gently controllably expelled from the laminar-pouch through the single pouch-throat to flood the uppersurface whenever the user's outstretched hand palm presses toward the washcloth member lowersurface;

B. a pair of substantially transversely aligned thumbopenings surrounded by the washcloth member periphery and extending vertically through the washcloth member on opposite sides of the central-axis thereby accommodating for said outstretched hand the dextrously preferred of the user's two hands, said thumbopenings being located trailwardly the washcloth member single pouch-throat;

C. a transversely extending hand-engaging means attached to the washcloth member and located below the lowersurface thereof so as to maintain the user's hand palm toward the washcloth member lowersurface and the fingertips positioned within the washcloth periphery; and

D. hydrophobic barrier means to retard cleansing liquid seepage from the laminar-pouch to the hand-engaging means.

4,349,289

LOOSE LEAF BINDER

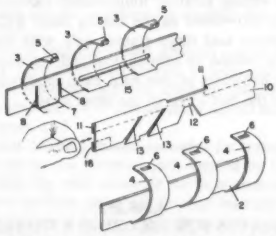
Vincenzo E. Cardellini, Rua Manuel Maria Tourinho, 673, 01236 Sao Paulo, SP, Brazil

Continuation-in-part of Ser. No. 35,080, May 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 21,682, Mar. 19, 1979, abandoned, which is a continuation of Ser. No. 895,440, Apr. 11, 1978, abandoned. This application Jun. 3, 1980, Ser. No. 156,099

Claims priority, application Brazil, Apr. 19, 1977, 7702458[U]; May 2, 1978, 7802756[U]

Int. Cl.³ B42F *3/04, 13/18*

U.S. Cl. 402—30 **6 Claims**



1. A loose leaf binder comprising:

first and second elongated strips each having a plurality of half loops joined to an edge thereof at corresponding spaced locations along said edge;

means provided at the ends of said half loops to permit a half loop associated with one strip to interlock with a half loop associated with the other strip to form a full loop when the strips are positioned in juxtaposition;

a plurality of clip means hingedly interconnecting said strips, each of said clip means being located proximate said edges of the strips;

means provided on one of said strips for permitting movement of said clip means transversely of said strip;

an actuator slidably joined to one of said strips, said actuator having a plurality of parallel inclined slots adapted to receive said clip means whereby when said actuator is moved in a direction longitudinally of said elongated strips, movement of the clip means within said slots displaces the clip means transversely of said one strip to

engage an edge of the other strip thereby moving said other strip to release its half loops from interlocking relationship with the half loops of said one strip.

4,349,290

LOOSE LEAF BINDER

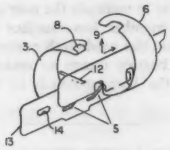
Claudio B. Cardellini, Rua Manuel Maria Tourinho, 673, 01236 Sao Paulo SP, Brazil

Filed Mar. 19, 1980, Ser. No. 131,766

Claims priority, application Brazil, Mar. 21, 1979, 7901760[U]

Int. Cl.³ B42F *3/02, 13/22*

U.S. Cl. 402—55 **4 Claims**



1. A loose leaf binder comprising:

a pair of elongated strips each having a plurality of half-rings at corresponding spaced locations along an edge thereof;

means provided at the ends of said half-rings to permit a half-ring associated with one strip to interlock with a half-ring associated with the other strip to form a full ring when the rings are positioned in juxtaposition;

a plurality of linking rings hingedly interconnecting said strips, each of said linking rings extending through a separate pair of parallel slots provided in one of said strips, said slots being inclined with respect to the longitudinal axes of said strips whereby during relative longitudinal movement between the strips, movement of the linking rings within said slots also displaces said strips transversely with respect to one another to release by longitudinal and elevational displacement the half-rings of one strip from interlocking relationship with the half loops of the other strip.

4,349,291

APPARATUS FOR SECURING A WHEEL TO A ROTATABLE SHAFT OF A TURBOMACHINE

Carl H. Geary, Jr., Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 955,428, Oct. 27, 1978, Pat. No. 4,293,996. This application Apr. 24, 1981, Ser. No. 257,295

Int. Cl.³ B63H *1/20*

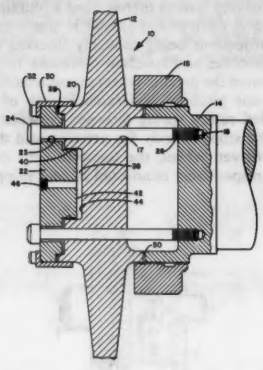
U.S. Cl. 403—15 **7 Claims**

1. Apparatus for securing a wheel to a rotatable shaft of a turbomachine comprising:

an outside member disposed axially outside the wheel, wherein surfaces of the wheel and the outside member define an expansible chamber;

a plurality of connecting means axially extending through aligned apertures defined by the shaft, the wheel, and the outside member, with a first end of the connecting means secured to the shaft and a second end of the connecting means engaging the outside member;

means for generating a force within the expansible chamber to move the outside member relative to the wheel to apply a stretching force to the connecting means and a compressive force to the wheel, axially compressing the wheel against the shaft; and



means for maintaining the stretching force on the connecting means and the compressive force on the wheel to allow removal of the force generating means.

4,349,292

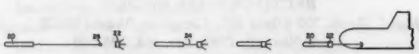
IN-FLIGHT HYDROPHONE DEPLOYMENT SYSTEM FOR UNDERWATER VEHICLES

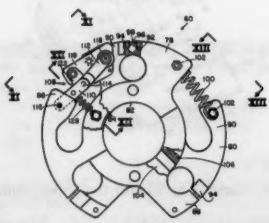
Orrin W. Albert, Jr., Escondido, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 113,917, Jan. 21, 1980, Pat. No. 4,283,731. This application Mar. 5, 1981, Ser. No. 240,729

Int. Cl.³ B25G *3/18;* **F16B** *21/00;* **F16D** *1/00*

U.S. Cl. 403—322 **2 Claims**





1. A retention and releasing apparatus comprising:

a link having a knob mounted on one end thereof;

a pair of plates, each plate having a central aperture for rotatable mounting on a shaft with the plates in a spaced relationship with respect to one another;

each plate having a plurality of arms in the plane of the plate, and each arm having a transverse flange which extends into the spacing between the plates so that pairs of flanges, made up of a flange from each respective arm, are capable of opening and closing with respect to one another as the plates are rotated in opposite directions on the shaft;

each flange having a recess so that each pair of flanges provides a socket for retaining or releasing the knob on a respective link;

spring means interconnecting the plates for biasing the pairs of flanges to an open releasing position;

means mounted to the plates for stopping the pairs of flanges at a predetermined open position and

means for locking and unlocking the pairs of flanges from the closed positions to the open positions.

4,349,293

COMPOUND BLOCK KIT

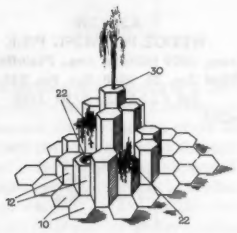
Hugo Rosenberger, Alzenauer Strasse 31, D 8756 Kahl, Fed. Rep. of Germany

Filed Jan. 8, 1980, Ser. No. 110,554

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 2900852

Int. Cl.³ A01G *9/02;* **B05B** *17/08;* **E01C** *5/06*

U.S. Cl. 404—41 **21 Claims**



1. Compound block kit comprising compound blocks; said compound blocks having similar cross-sectional form and size and having a height variable from the height of cobblestones to a height substantially above the surface of cobblestones corresponding to palisade height; said compound blocks having edge-teeth extending about the entire block circumference and being meshingly engageable with one another, neighboring compound blocks being meshed by engagement of corresponding edge-teeth on the block circumferences for holding the blocks firmly in place and for mutually supporting each other, meshing of neighboring compound blocks forming interlocking of the blocks to result in a homogeneous combination so that blocks at the height of cobblestones can firmly support blocks with heights substantially above heights of cobblestones.

4,349,294

CONCRETE TOPPING SPREADER SYSTEM

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Filed Jul. 18, 1980, Ser. No. 170,126

Int. Cl.³ E01C *19/18*

U.S. Cl. 404—110 **11 Claims**

11. Apparatus for uniformly spreading a topping material over a wet concrete surface area having a length, width and opposing sides, said apparatus comprising:

a. a spreader including a hopper for storing a supply of loose particulate topping material and for dispensing a uniformly wide layer of the topping material from an elongated slot in said hopper as said spreader is translated along a path, said hopper further including

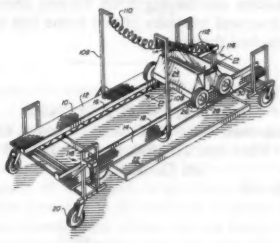
i. a first end member inclined at an angle to the vertical and including top and bottom surfaces; and

ii. a second end member positioned opposite said first end member and including top and bottom surfaces, the bottom surfaces of said first and second members converging together to form said elongated slot;

b. means coupled to said first end member of said hopper for vibrating said first end member;

c. bridge means supported above and spanning the width of the concrete surface area without contacting the concrete surface and translatable along the length of the concrete surface area for providing an elevated path to translate said spreader across a widthwise segment of the concrete surface area and for maintaining said spreader vertically spaced above and separated from the concrete surface;

d. means coupled to said spreader for metering the discharge of topping material from said elongated slot onto the widthwise segment of the concrete surface area at a rate proportional to the translation velocity of said spreader across said elevated bridge means and independent of the vertical spacing between said slot and the concrete surface, said metering means including



i. gate means coupled to said hopper and engaging said elongated slot for controlling the width of said slot; and

ii. means positioned within said hopper and above said elongated slot for agitating the topping material within said hopper;

e. control means coupled to said spreader and to said bridge means for permitting an operator located outside of the wet concrete surface area to remotely control the back and forth translations of said spreader across said elevated bridge means; and

f. drive means coupled to said spreader for translating said spreader across the elevated path formed by said bridge means over the wet concrete surface area to thereby dispense a uniform layer of topping material over the widthwise segment of the concrete surface area,

whereby sequential translations of said spreader across said bridge means followed by sequential translations of said bridge means along the length of the concrete surface area in displacements equal to the width of the layer of topping material dispensed by said spreader covers the entire concrete surface area with a uniform layer of topping material.

4,349,295

STRUCTURAL RIDGE MEMBER FOR VIBRATING CONCRETE SCREEDS

Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214

Division of Ser. No. 132,623, Mar. 21, 1980, Pat. No. 4,261,694. This application Apr. 6, 1981, Ser. No. 251,115

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

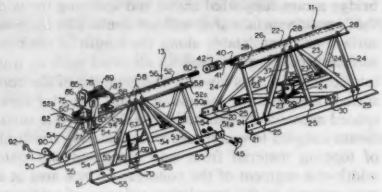
Int. Cl.³ E01C *19/40*

U.S. Cl. 404—114 **1 Claim**

1. A structural ridge member for use in air-vibrated concrete screeds of the isosceles triangle shaped, separable frame unit

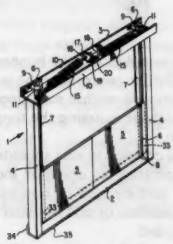
type, said ridge member being molded as an integral replaceable one piece member comprising:

(a) a hollow strengthening ridge tube portion adapted for being horizontally positioned at the apex of an isosceles triangle shaped screed frame unit so as to extend with its bore for the length of such frame unit and being internally threaded adjacent each of its bore ends; and



(b) integral with said ridge tube portion on opposite sides thereof downwardly and outwardly extending integral solid flange portions extending for the length of said ridge tube portion and having holes formed therein enabling other structural members of said frame unit to be detachably attached thereto.

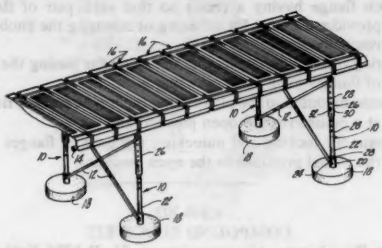
4,349,296
IRRIGATION DITCH GATE
Peter J. Langeman, Box 765, Coaldale, Alberta, Canada
Filed Jan. 28, 1980, Ser. No. 116,085
Int. Cl.³ E02B 7/40
U.S. Cl. 405—99 **9 Claims**



1. A gate for automatically maintaining predetermined water levels in an irrigation ditch comprising a frame for mounting in the ditch; gates means pivotally mounted in said frame for rotation between open and closed positions to permit or prevent water flow therethrough; spring means connected to said frame means and to said gate means for continuously biasing said gate means to the closed position; and readily actuatable means for adjusting the spring bias, so that the pressure and hence the water level required to open said gate means against the spring bias can be adjusted.

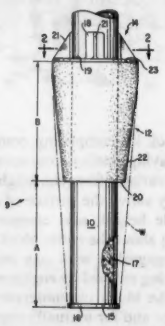
4,349,297
BOAT DOCK
Terrance J. Misener, 5685 N. River Rd., Freeland, Mich. 48623
Filed Nov. 19, 1980, Ser. No. 208,238
Int. Cl.³ E02B 3/20
U.S. Cl. 405—221 **16 Claims**

1. A boat dock comprising a plurality of pairs of laterally spaced, upright tubular stanchions which are adjustable in height, an enlarged base at the lower end of each stanchion adapted to rest on the underwater ground surface to support the stanchion in an upright position, a tee fitting having a depending upright stem telescopically engaged within the upper end of each stanchion, each of said fittings having a cross bar at its upper end extending lengthwise of the dock, a tubular stringer extending lengthwise of the dock between the successive tee fittings, the opposite ends of the cross bars being received in the ends of the successive tubular stringers and rigidly and removably secured thereto, and a plurality of succes-



sive plastic resin planks supported at their opposite ends by said stringers, each of said planks having a generally flat top tread surface and a bore adjacent each end thereof extending transversely of the plank, said bores being telescopically and slideably received over said stringers.

4,349,298
WEDGE-FORMING PILE
William E. Kruse, 1009 Hillside Ave., Plainfield, N.J. 07060
Filed Jan. 24, 1980, Ser. No. 115,052
Int. Cl.³ E02D 5/30, 5/48
U.S. Cl. 405—256 **16 Claims**



1. A wedge forming pile which comprises:

(a) an elongated pile shaft having a bottom tip and an upper end and

(b) wedge forming means of castable material spaced upward of the tip of the pile shaft and proximate to said tip,

(c) said pile shaft extending above and below said wedge-forming means,

(d) the minimum combined width of said pile shaft and accompanying wedge-forming means from side wall to side wall being greater than the width of said pile shaft immediately above said wedge-forming means and greater than the width of said pile shaft immediately below said wedge-forming means,

(e) the ratio of the height of said wedge-forming means to the width of said pile shaft immediately below said wedge-forming means being approximately 2.7:1,

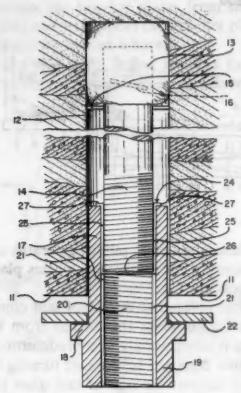
(f) whereby the outer portions of said tip, said wedge-forming means and the portions of the pile shaft therebetween accommodate the formation of a soil wedge during driving of said pile.

4,349,299

ROOF BOLT TENSION HEAD AND METHOD OF USE

Nicholas R. Eny, Cheverly, Md., assignor to Stephen F. Koval, Portage, Pa.

Continuation-in-part of Ser. No. 124,754, Feb. 26, 1980, abandoned. This application Jul. 21, 1980, Ser. No. 170,829
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—261 11 Claims



1. A tension head for a bolt inserted in a drill hole in a rock formation comprising a sleeve with a threaded bore extending therethrough, wrench flats at one end of the sleeve, a pair of oppositely disposed keyways extending through the bore, and stop means fitted in the keyways and supported by the sleeve for forced engagement with the bolt end when the sleeve is screwed thereon, whereby rotation of the sleeve rotates the bolt, but which are deformed by further rotational advance of the sleeve on the bolt so as to be pushed toward the wrench flat end of the sleeve by the bolt end.

4,349,300

SYSTEMIC ROOF SUPPORT

Jay H. Kelley, 104-1/2 Watson Ave., Fairmont, W. Va. 26554

Continuation-in-part of Ser. No. 45,501, Jun. 4, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,598
Int. Cl.³ E21D *11/00;* E04C *5/12*
U.S. Cl. 405—288 17 Claims

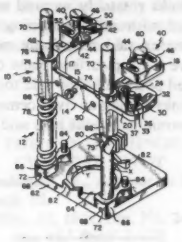
1. A method for systemic roof control of native roof strata in a mine opening including the steps of horizontally arranging an elongated tensile member immediately below the lowest stratum layer of native roof strata which is, securing anchors within general strata horizontally remote to the native roof strata to impose reactive anchoring forces compressively upon the upper general strata at sites distally isolated from the native roof strata, coupling the tensile member to the anchor members under a prestressed elongation, and using the tensile member to resolve the prestressing forces into compressive forces applied uniformly in only directions normal to the roof strata for increasing friction between layers of native roof strata to impart vertical shear resistance without significant horizontal compression of the native roof strata.

4,349,301

CARRIAGE SUPPORT FOR POWER-DRIVEN HAND TOOL

Alfred Z. Boyajian, P.O. Box 811, Manhattan Beach, Calif. 90266

Filed Apr. 28, 1980, Ser. No. 144,318
Int. Cl.³ B23B *45/14*
U.S. Cl. 408—112 23 Claims



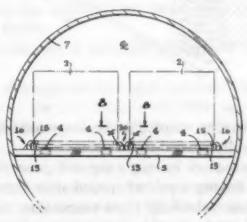
1. A support for supporting an electric power-driven tool comprising a tool housing containing vent holes, an electric motor in the housing and a chuck coupled to the motor for rotation, comprising first means defining a carriage member adapted to support the tool housing in a position such that the axis of rotation of the chuck is perpendicular or horizontal second means mounted to the carriage member to clamp the tool housing thereto, said second means being transversely-spaced and dimensioned to be engaged with the vent holes of the tool housing at diametrically opposite sides thereof, third means mounting one of said second means for movement relative to the other and fourth means for fixing said third means in a position of engagement of said second means with the vent holes after being positioned therein.

4,349,302

PALLET LATCHING MECHANISM

Jesse T. Ferguson, Jr., La Canada, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jul. 7, 1980, Ser. No. 166,577
Int. Cl.³ B60P *1/64, 7/08;* B61D *45/00;* B63B *25/22*
U.S. Cl. 410—69 16 Claims



1. A cargo restraint mechanism for securing a cargo unit load device in a vehicle having a floor structure, comprising:
means for restraining said unit load device;
means associated with said floor structure and said restraining means for alternatively transferring said retaining means to an erected position above the top surface plane of said floor structure and a retracted position below said top surface plane;
means interacting with said transferring means for receiving

a first unidirectional force such that upon application of said force said restraining means is movable from said retracted position to said erected position;

said transferring means being further adapted to transfer said restraining means from said erected position to said retracted position upon application of a second unidirectional force to said restraining means.

10. A self-locking cargo restraint module for securing a cargo unit load device to a vehicle floor structure, comprising:

frame means adapted to be mounted to said floor means;

means for restraining said unit load device; and

a linkage mechanism, said linkage mechanism including a plurality of links rotatably secured to said frame means and associated with said restraining means for alternatively transferring said restraining means to an erected position above the top-surface plane of said frame means and a retracted position below said top-surface plane, said plurality of links having an over-center stop arrangement when said restraining means is in said erected position.

4,349,303

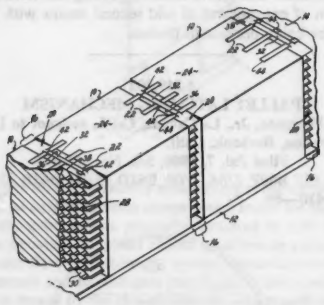
LOAD SPACER

Henry L. Liebel, and Martin Krier, both of Cincinnati, Ohio, assignors to Angleboard Inc., Cincinnati, Ohio

Filed Sep. 13, 1979, Ser. No. 75,085

Int. Cl.³ B61D *45/00*

U.S. Cl. 410—154 **11 Claims**



1. A load spacer adapted to be suspended from the top of adjacent laterally spaced loads comprising

a cellular structure having a top and generally planar sides, said top having a pair of spaced slots therein, and

an elongated, relatively rigid suspension member inserted into and through said slots across said top in a weave pattern such that portions of said top lie on either side of said suspension member with at least one end of said member projecting laterally beyond a side of said structure,

said portions lying on either side of said suspension member being offset by the thickness of said suspension member such that said suspension member is held in place by the frictional force between the mating surfaces of said suspension member and said portions of said top and the binding force of said offset.

4,349,304

AUTOMATIC GLASS PLATE PILING APPARATUS

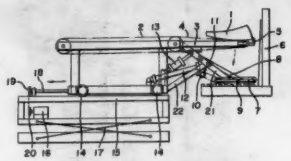
Hiroyuki Ogawa, and Haruhiko Kaki, both of Kanagawa, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 939,736, Sep. 5, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,199

Claims priority, application Japan, Apr. 8, 1976, 51-38706

Int. Cl.³ B65G *57/00*

U.S. Cl. 414—106 **5 Claims**



1. An automatic glass plate piling apparatus comprising:

a feeding conveyor for conveying a glass plate in the horizontal direction;

a turning frame pivoted at an end of said conveyor so as to receive said glass plate transferred from said conveyor and to turn it downwardly at a predetermined angle;

a transfer frame disposed below said turning frame so as to receive and support the rear of said glass plate from said turning frame at about the time of the end of the turning operation;

a horizontal transfer conveyor comprising

a plurality of horizontal endless conveyors provided on the lower end of the transfer frame so as to support the lower edge of the glass plate transferred to the transfer frame; and

means for simultaneously turning said transfer frame about a horizontal axis to cause said transfer frame to stand up and to move said horizontal transfer conveyor forward and the cooperative action of the turning of the transfer frame and the movement of the horizontal transfer conveyor acts to drive said glass plate against a pallet,

whereby said lower edge of said glass plate is maintained forward of the center of gravity of said glass plate by the movement of said horizontal transfer conveyor during said turning of said transfer frame.

4,349,305

LIFTING AND DUMPING APPARATUS

Charles C. Wynn, Maryville, and Donald J. Hopkins, Knoxville, both of Tenn., assignors to Dempster Systems Inc., Knoxville, Tenn.

Continuation of Ser. No. 848,832, Nov. 1, 1977, abandoned. This application Dec. 29, 1980, Ser. No. 220,768

Int. Cl.³ B65B *21/02*

U.S. Cl. 414—408 **3 Claims**

1. A lifting and dumping apparatus for dumping the contents of a container into the body of a vehicle including:

a pair of lift arms pivotally secured to the vehicle for movement between a lower position in which the front portions of the lift arms extend forward of the vehicle and an upper position in which the front portions of the lift arms extend above the vehicle;

lift arm power means to move the lift arms between their lower and upper positions;

a front cross member extending between and rotatably supported by the front portions of the lift arms;

a pair of fork arms for engaging the container;

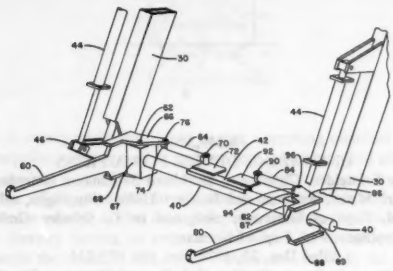
attaching means to secure the fork arms to the front cross member, and including

two pins extending from the front cross member wherein the pins are generally vertical when the fork arms engage the container,

two bracket plates wherein each bracket plate is pivotally supported by a pin and each fork arm is secured to a bracket plate for pivotal movement therewith between an open position and a closed position, wherein the fork arms extend forward of the lift arms for engagement with the container, and a closed position, wherein the fork arms are generally parallel to the front cross member, and

spacing members mounted on the front cross member and extending between the front cross member and the bracket plates to prevent the bracket plates from sliding along the axes of the pins and to support the bracket plates for pivotal movement thereabout, and wherein

back ends of the fork arms define notches for receiving the front cross member as the fork arms move into the open



position wherein the front cross member supports the fork arms when the fork arms are in the open position;

dumping means connected to the lift arms and the front cross member for rotating the front cross member, and pivoting the fork arms about the axis of the front cross member; and

fork arm power means to pivot the fork arms between their open and closed positions, and including

a pair of hydraulic cylinders, each having a movable piston rod connected to one of the bracket plates to pivot the fork arms between their open and closed positions, and

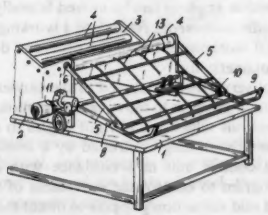
a hydraulic fluid circuit connected to the hydraulic cylinders to move the piston rods thereof, and including sequencing means to alternately pivot the fork arms from their open position to their closed position.

4,349,306

APPARATUS FOR LOADING WEB SUPPLY ROLLS INTO FOLDING MACHINES

Carlo Fonio, Galliate, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Aug. 6, 1980, Ser. No. 175,628
Claims priority, application Italy, Sep. 25, 1979, 25967 A/79
Int. Cl.³ B65G *65/02*
U.S. Cl. 414—684 **6 Claims**



1. An apparatus for loading supply rolls of web material onto a folding machine of the type having a roll supporting cradle formed between spaced side plates of a movable carriage mounted for reciprocating movement on a folding table, said apparatus comprising:

(a) a roll guide frame (5) pivotably attached to and extending from one end of the spaced side plates;

(b) an elevator frame (8) pivotably connected to and extending from the spaced side plates in spaced relation below and in general alignment with said roll guide frame (5);

(c) means forming one end of said elevator frame (8) for supporting a web supply roll;

(d) drive means operatively connected to said elevator frame (8) for pivoting the latter upwardly and downwardly between preselected positions; and

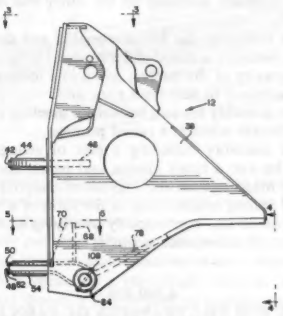
(e) means attached to said elevator frame (8) for raising said roll guide frame (5) simultaneously therewith to a position for receiving the supply roll from said elevator frame and guiding the same into the machine's cradle.

4,349,307

STRUCTURE FOR CENTER HINGE AND BOOM CYLINDER PIVOT

John E. Klem, Waukegan, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Mar. 31, 1981, Ser. No. 249,573
Int. Cl.³ B66F *9/075*
U.S. Cl. 414—686 **7 Claims**



1. In a loader having a frame with a pair of boom arms pivotally mounted thereon, a pair of boom cylinders pivotally connected to the boom arms for raising and lowering thereof, an improved mounting for pivotal connection of the boom cylinders to the frame comprising:

a tube spanning the width of the frame and secured thereto;

a pair of stub shafts;

a stub shaft positioned in each end of the tube and protruding therefrom;

a bolt passing through the tube and the inner end of each stub shaft to secure the stub shaft in the tube; and

the bolt being substantially in alignment with the boom cylinder when fully extended.

3. In an articulated loader having front and rear frames pivotally interconnected by upper and lower hinges, a pair of boom arms pivotally mounted on the front frame, and a pair of boom cylinders connected between the front frame and the boom arms; and improved support for the lower hinge on the front frame comprising:

a tube extending across and secured to the front frame;

upper and lower plates secured to the tube;

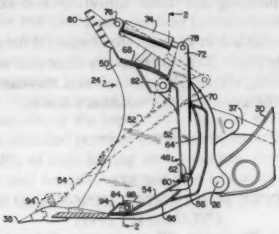
a bearing hub positioned between and secured to said plates; and

vertical members extending from said hub to the front frame and positioned between and secured to said plates to form a box section.

4,349,308
FRONT END LOADER WITH BUCKET EJECTOR ASSEMBLY

John W. Buckstead, Overland Park; Frederick J. Hoppe, Shawnee Mission, both of Kans., and Dennis W. Williams, Kansas City, Mo., assignors to Paccar, Inc., Bellevue, Wash.

Filed May 27, 1980, Ser. No. 153,711
Int. Cl.³ E02F 3/81
U.S. Cl. 414—725 6 Claims

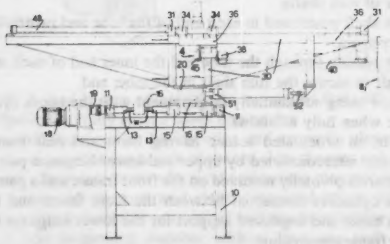


1. In a front end loader,
a tractor having a pair of front tires and a pair of rear tires;
a boom assembly having one end thereof swingably connected to the tractor;
a bucket pivotally mounted on the other end of the boom assembly;
means for swinging said boom assembly and therefore said bucket, between a raised and a lowered position, the center of gravity of the bucket, when in a lowered position, being proximal to said front tires; and
an ejector assembly for said bucket for ejecting the contents of the bucket when in a raised position,
said ejector assembly including a pair of swingable panels within said bucket; a hinge joining said panels and means for sealing said hinge against the ingress of material within the bucket, said sealing means being in the form of a half tube on one of said panels and continuously overlying said hinge during operation of said ejector assembly.

4,349,309
DEVICE FOR THE TRANSFER OF YARN HANKS

Federico Minnetti, Pieve a Nievole, Italy, assignor to Officine Minnetti di Ornella Raveggi & C.S.n.c., Pieve a Nievole, Italy

Filed Mar. 13, 1980, Ser. No. 129,881
Claims priority, application Italy, Sep. 28, 1979, 26128 A/79
Int. Cl.³ B65H 54/56
U.S. Cl. 414—744 A 5 Claims

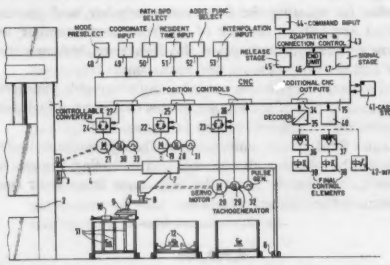


1. A device for transferring yarn hanks from a first support or carrier to a second support or carrier, one of said first and second supports being a moving support, said device comprising: a vertical structure (10) having slide guides (12, 13) integral therewith and extending parallel to the direction of movement of said one support; a carriage (16) movable on said guides; means for moving said carriage; a rotatable head (20) carried by said carriage; means for rotating said head; a frame (30) integral with said rotating head; slide bars (32, 33) carried by said rotatable head; a slider (36) movable on said slide bars; means for moving said slider; spreadable skein-holder rods (40, 41) carried by said slider; and means for moving said rods between a closed position in which the rods are parallel and closely spaced from each other and a spaced apart position; said rods in the closed position being insertable into a yarn hank to be transferred from the first support and being moved to the spaced apart position to thereby transfer the yarn hank to said rods, movement of said slider and said rotatable head moving said rods into a position for transferring the yarn hank to the second support.

4,349,310
UNLOADING DEVICE FOR A PRESS

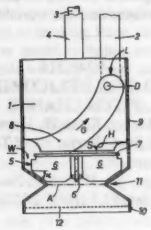
Franz Schneider, Göppingen; Burkhard Schumann, Ottenbach; Karl Maier, Kuchen, and Herbert Höhn, Göppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Göppingen, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,214
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757629
Int. Cl.³ B25J 9/00
U.S. Cl. 414—749 9 Claims



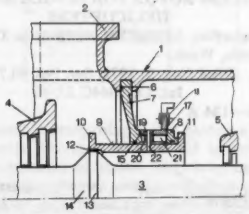
1. An unloading device for moving workpieces from a press into containers located alongside the press, comprising:
a carrier frame extending over the containers;
a guide rail mounted on the side of the press, wherein one end of the carrier frame is inserted in said guide rail for movement in a first direction along the side of the press;
extraction grippers mounted on said carrier frame wherein said extraction grippers can be moved laterally outside of an area under said carrier frame into a working area of the press to lift workpieces out of the press and deliver them to the containers; and
a plurality of servo drives coupled to the carrier frame and the extraction grippers to move said extraction grippers in three directions which are at right angles to each other, said servo drives being controlled by a continuous-path numerical control unit in accordance with a predetermined program to control the movement of said carrier frame and said extraction grippers to direct the extraction grippers into the working area of the press to lift the workpieces out of the press and move them into the area under the carrier frame to stack the workpieces in order in the containers alongside the press according to control signals from the numerical control unit.

4,349,311
ROTARY PUMP
Arthur Milz, Bodenmühle, Wald, Switzerland
Filed Mar. 28, 1980, Ser. No. 135,089
Claims priority, application Switzerland, Apr. 9, 1979, 3327/79
Int. Cl.³ F04D 29/44
U.S. Cl. 415—112 5 Claims



1. A rotary pump for liquids having a working chamber and an impeller rotating within said working chamber, said chamber having a spirally wound duct leading from one frontal surface of the chamber to the outlet pipe of the pump, the upstream mouth of the duct obliquely entering the chamber and thereby having an end portion which is laterally open towards the chamber and forms a channel in its wall; the path of the duct winding helically around the axis of rotation of the impeller, with a progressively decreasing radial distance from said axis to the inside wall of such duct and a progressively increasing pitch, when viewed in the direction of the flow; including a solid stator and said duct being formed as an open groove on the exterior surface thereof and a casing surrounding said stator and closing said groove.

4,349,312
APPARATUS FOR THE CONTROLLED EXTRACTION OF STEAM FROM EXTRACTION TURBINES
Karl Stieger, Turgi, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland
Filed Apr. 1, 1980, Ser. No. 136,348
Claims priority, application Switzerland, Jul. 12, 1979, 6496/79
Int. Cl.³ F01D 17/00
U.S. Cl. 415—145 2 Claims



1. In a turbine comprising a housing, a turbine shaft, a turbine blade channel, and apparatus for controlled extraction of steam from one stage of the blade channel, the improvement wherein said apparatus comprises:

a wall mounted within said turbine housing and including first and second axially spaced stops,

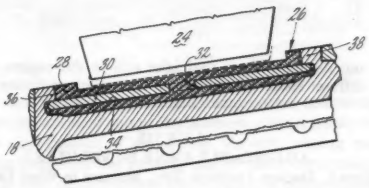
a regulating drum surrounding said turbine shaft concentrically and spaced therefrom to define therewith a steam passage, said drum including first and second flanges and being axially movable to shift said flanges with said stops which define first and second positions of said drum,

said drum including sealing means at a steam entry end of said passage cooperating with a cylindrical portion of said shaft to form therewith a throttle gap,

the size of said gap varying from a minimum to a maximum in response to axial movement of said drum from said first position, and

actuating means for moving said regulating drum to vary the size of said gap and thereby control the amount of steam passing therethrough.

4,349,313
ABRADABLE RUB STRIP
Alan D. Munroe, Glastonbury, and Peter E. Voyer, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 26, 1979, Ser. No. 106,582
Int. Cl.³ F01D 11/08
U.S. Cl. 415—174 10 Claims



1. In a gas turbine engine of the type having an engine case spaced from and circumscribing an array of rotor blades, the improvement which comprises:

an abradable rub strip which is attached to the engine case and which circumscribes the array of rotor blades, the rub strip being formed of a viscoelastic material and having embedded therein a ring formed of metallic material;

wherein the ring limits the depth of penetration of the rub strip by the rotor blade upon contact between the rotor blade and the rub strip and

wherein the ring is spaced from the rotor blades during normal operation of the rotor blades to prevent contact between the rotor blades and the rub strip.

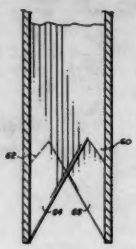
4,349,314
COMPRESSOR DIFFUSER AND METHOD
John R. Erwin, Paradise Valley, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed May 19, 1980, Ser. No. 151,070
Int. Cl.³ F04D 29/44
U.S. Cl. 415—181 19 Claims

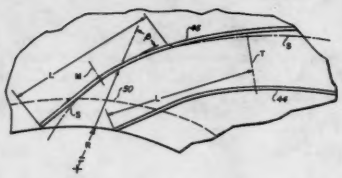
1. A method of diffusing pressurized exhaust flow exiting a compressor at transonic conditions, comprising:

delivering the exhaust flow into a diffuser space bounded by inner and outer sidewalls at transonic conditions at the inlet end of the diffuser space and in a generally logarithmic sprial direction;

intercepting boundary layer flow at both of said inner and outer sidewalls in the region of said diffusing space subject to said transonic conditions; and

maintaining the cross-sectional area of said diffusing space approximately constant or gradually increasing at increasing distances from said inlet end in the region of said diffuser space subject to said transonic conditions.





4,349,315

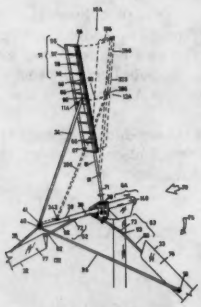
ADJUSTABLE VANE WINDMILLS

William L. Ducker, Lubbock, Tex., assignor to Wind Engineering Corporation, Lubbock, Tex.

Continuation of Ser. No. 874,222, Feb. 1, 1978, Pat. No. 4,183,715. This application Jan. 11, 1980, Ser. No. 111,352

Int. Cl.³ F03D 7/04

U.S. Cl. 416—1 **4 Claims**



1. A method for adjusting the pitch of a plurality of like windmill airfoil blades behind a tower support therefor comprising the steps of:

bending each of a plurality of rigid spars into at least two sections,

mounting the section of each of said spars nearest one end for rotation relative to a surface transverse to the direction of motion of the wind and at an angle to said surface forming a fixed dihedral angle,

securing the airfoil blade in a longitudinal direction to the section nearest the other end thereof of the spar and then concurrently and equally and continuously firmly supporting and moving each of said blades in an arcuate direction substantially paralled with the direction of motion of the wind for adjusting a variable dihedral angle in response to the force of the wind and torque developed by said blades to change the pitch of the airfoil relative to the wind wherein the total dihedral angle of the each of said blades is a composite angle comprising the fixed dihedral angle and the blades move with an angle to the direction of the motion of the wind that decreases as the speed of the wind increases and with a forward motion of the peripheral portion of each blade as the speed of such blade increases and a rearward motion of the peripheral portion of each blade as the speed of such blade decreases and the variable dihedral angle.

4,349,316

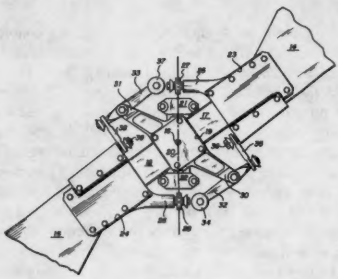
TWIST CONTROL FOR HELICOPTER TAIL ROTOR PITCH CHANGE

Charles W. Hughes, Hurst; Keith W. Harvey, and Walter G. O. Sonneborn, both of Fort Worth, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 24, 1979, Ser. No. 32,785

Int. Cl.³ B64C 27/38

U.S. Cl. 416—104 **7 Claims**



1. A bearingless helicopter tail rotor characterized by inboard twist sections on opposite sides of a central hub section and extending to outboard margins at which a blade grip is attached and which may twist to accommodate pitch inputs to the blade grips, the improvement comprising:

pitch horns mounted adjacent said outboard margins of said twist sections extending to a negative delta$_3$ connection point.

4,349,317

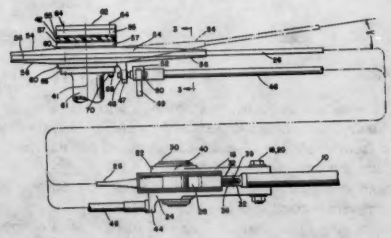
BEARINGLESS ROTOR FOR SINGLE AND TANDEM HELICOPTERS

Rene A. Desjardins, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 2, 1979, Ser. No. 90,717

Int. Cl.³ B64C 27/40

U.S. Cl. 416—134 A **9 Claims**



1. In a bearingless rotor system of a helicopter, including:

a rotor hub defining a rotor center;

at least one unitary strap member mounted on the rotor hub, each strap member having at least two arms which extend radially outwardly from the rotor center and define a continuous upper and lower surface and opposite outboard ends; and

a rotor blade attached to each outboard end of each arm, the improvement comprising:

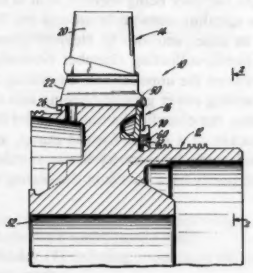
at least one unitary contoured upper shoe member having a planar surface and an opposed contoured surface defining a constant thickness portion and radially opposed varying thickness portions extending from the constant thickness portion, said shoe member being mounted on the rotor hub and engageable with its planar surface with the upper surface of each arm of a respective strap member, and at least one unitary contoured lower shoe member having a planar surface and an opposed contoured surface defining a constant thickness portion and radially opposed varying thickness portions extending from the constant thickness portion, said shoe member being mounted on the rotor hub and engageable with its planar surface with the lower surface of each arm of a respective strap member, said shoe members serving to resist flapwise flexural displacement of the arms of their respective strap members and exert a force due to flapwise flexural displacement of the varying thickness portions of said shoe members with the arms of their respective strap members, tending to restore the arms of their respective strap members to their non-deflected position and to define a virtual hinge, the radial offset of which is within ten percent of the rotor radius.

4,349,318

BOLTLESS BLADE RETAINER FOR A TURBINE WHEEL

Zoltan L. Libertini, Stamford, and Theodore Ivanko, Fairfield, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 4, 1980, Ser. No. 109,719
Int. Cl.³ F01D *5/32*
U.S. Cl. 416—220 R **10 Claims**



1. A rotor assembly comprising a disc having a plurality of elongated channels provided therein and spaced along its periphery, and a plurality of blades, said blades each having a root portion corresponding in configuration to said channel portion, one end of each blade root portion being provided with a tang which bears against one end of the disc adjacent a channel to prevent longitudinal movement of the blade root in the channel in one axial direction, the opposite end of said blade root and the disc including cooperating peripheral cut-outs which define a continuous locking groove, blade retention means disposed at said opposite end of the blade root for preventing longitudinal movement of the blade in the channel in the opposed axial direction, said blade retention means including:

a continuous retainer element disposed in said locking groove;

a generally cylindrical plate member concentrically mounted on said disc and including a radially outwardly extending peripheral portion which cooperates with the locking groove for maintaining said continuous retainer element in place, said cylindrical plate member and the disc including opposed, peripheral continuous slots, and

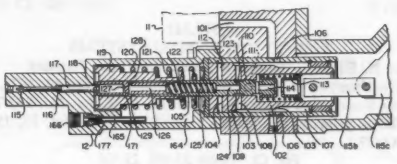
a split retainer ring disposed in said opposed continuous slots.

4,349,319

PRESSURE AND FLOW COMPENSATED CONTROL SYSTEM WITH CONSTANT TORQUE AND VISCOSITY SENSING OVER-RIDE

J. Otto Byers, Jr., Canfield, and Donald A. Locher, Hubbard, both of Ohio, assignors to Commercial Shearing, Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 771,672, Feb. 24, 1977, abandoned. This application Jul. 24, 1980, Ser. No. 171,896
Int. Cl.³ F04B *1/28*
U.S. Cl. 417—222 **11 Claims**



1. A variable displacement fluid pump system comprising a variable displacement pump, displacement control means varying the displacement of said pump, viscosity sensing means receiving fluid from said pump acting on said control means to over-ride said control means and reduce the pump displacement when the viscosity of the fluid in the pump exceeds a predetermined value, pressure sensing means receiving fluid from said pump acting on said control means to over-ride said control means and reduce the pump displacement when the pressure in the system exceeds a predetermined value, at least one pressure compensated work port valve receiving pressure fluid from said pump to deliver said pressure fluid selectively to a hydraulic work element and a variable by-pass valve receiving pressure fluid from the pump not required by the pressure compensated work port valve to variably by-pass excess fluid from said pressure compensated valve and acting on said control means to vary the displacement of said variable displacement pump to satisfy the fluid requirements of said pressure compensated valve above a minimum established flow rate.

4,349,320

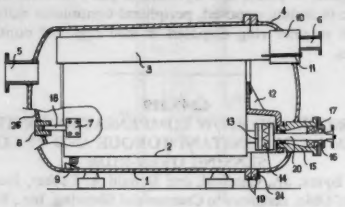
PISTON COMPRESSOR DERIVED FROM A RECIPROCATING THERMAL ENGINE

Francois J. Leorat, Versailles, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

PCT No. PCT/FR78/00029, § 371 Date Jun. 12, 1979, § 102(e) Date Jun. 12, 1979, PCT Pub. No. WO79/00199, PCT Pub. Date Apr. 19, 1979
PCT Filed Oct. 6, 1978, Ser. No. 140,197
Claims priority, application France, Oct. 12, 1977, 77 30663
Int. Cl.³ F04B *41/04*
U.S. Cl. 417—237 **5 Claims**

1. A piston compressor of the sealed housing type, comprising a specific compressor cylinder-head completed by an assembly of parts for a mass-production internal combustion engine including a cylinder-block and driven through the sealed housing by an external motor by drive means passing through a support member, said compressor being adapted to fit with a cover of said sealed housing through its cylinder-head, wherein the compressor is secured to said cover by

means of a first coupling member fixed on said cylinder-head and by a second coupling member fixed on said cylinder-block



and bearing on said support of said drive means of the compressor through said cover of said sealed housing.

4,349,321

LIQUID DISPENSING SYSTEMS

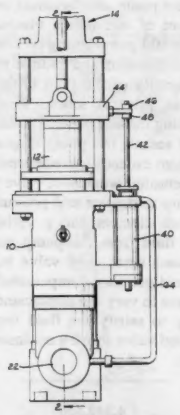
Peter N. Bentley, "Sandown", Stoke-on-Trent, England

Continuation-in-part of Ser. No. 904,563, May 10, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,875

Claims priority, application United Kingdom, Jul. 22, 1977, 30813/77

Int. Cl.³ F04B *25/00, 23/06*

U.S. Cl. 417—250 **4 Claims**



1. Apparatus for feeding to a filter press sludge intimately admixed with an accurately metered proportion of an additive, comprising a source of sludge, a filter press, a ram pump having an outlet connected through a check valve to the filter press and having an inlet, and a reciprocating metering pump for supplying an additive, having an outlet, wherein the improvement comprises apparatus for intimately admixing sludge with an accurately metered proportion of an additive, comprising a valve chamber which is connected between the inlet of the ram pump and a pipe connected to the source of sludge, said valve chamber having a substantially smaller inlet connected to the outlet of the metering pump, a valve seat in the valve chamber having a ball resting freely thereon, and an operative connection between the ram pump and the metering pump which synchronizes the suction stroke of the ram pump with the discharge stroke of the metering pump to cause the incoming sludge to lift and spin the ball and thereby mix the sludge with the incoming additive.

4,349,322

COOLING A MOTOR OF A CENTRIFUGAL PUMP FOR CONVEYING LIQUIDS WITH DEPOSITED SOLIDS

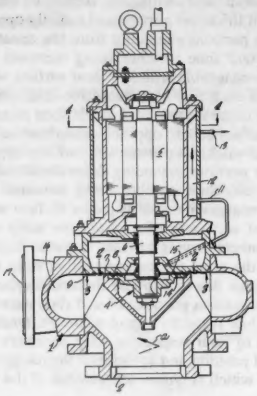
Martin Stahle, Postfach 12, CH-8213 Neunkirch, Switzerland

Filed Feb. 14, 1979, Ser. No. 12,075

Claims priority, application Switzerland, Feb. 14, 1978, 1596/78

Int. Cl.³ F04B *39/06*

U.S. Cl. 417—370 **2 Claims**



1. A centrifugal pump for conveying liquids with solids including a pump housing, a suction inlet, an outlet, a sealing cover for the housing and an annular surface for the sealing cover, an impeller having an annular surface, a pump shaft, the impeller being adapted for rotation by the shaft such that the respective annular surfaces are in closely spaced relationship, at least one groove formed in the annular surface of the sealing cover spiraling outwardly around the impeller axis, the annular surface of the impeller being formed with at least one groove, said groove spiraling outwardly around the impeller axis and opening at its outer end into an elevated pressure side of the housing, a liquid collecting chamber centrally located about the shaft between the impeller and the sealing cover, the outer end of the sealing cover groove opening into the pressure side of the housing, the chamber having an outlet for connection to a cooling jacket of a motor for the pump, and the chamber being formed partly by a cavity in the annular surface of the impeller and partly by a cavity in the sealing cover.

4,349,323

APPARATUS FOR CONTINUOUSLY FEEDING POWDERS

William B. Furbish, Black Earth, and Roscoe E. Baker, Verona, both of Wis., assignors to Ray-O-Vac Corporation, Madison, Wis.

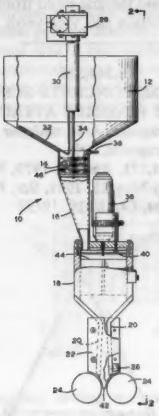
Filed Jan. 30, 1981, Ser. No. 229,967

Int. Cl.³ B29B *5/04*

U.S. Cl. 425—147 **5 Claims**

1. An apparatus for continuously feeding powders, the apparatus comprising a first hopper having a base, a second hopper disposed below the first hopper, a passageway connecting the base to the second hopper, a feed guide disposed below the second hopper and registered thereto, a wiper disposed within the first hopper, a bottle brush auger disposed within the base, means for rotating the wiper and the auger, a plurality of thin blades disposed within the second hopper and in close proxim-

ity with the passageway, means for rotating the blades, a distribution baffle disposed within the second hopper, and sensing



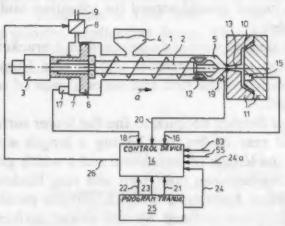
means for regulating the quantity of powder in the second hopper.

4,349,324

INJECTION MOLDING MACHINE

Engelbert Neff, Zollikon, and Friedrich Laimer, Reichenburg, both of Switzerland, assignors to Netstal-Maschinen AG, Switzerland

Filed Jul. 11, 1980, Ser. No. 168,664
Int. Cl.³ B29F *1/06*
U.S. Cl. 425—149 **13 Claims**



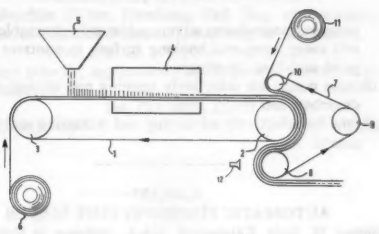
1. An injection molding machine, comprising:
a mold tool defining a mold cavity (10);
a material cylinder (1) defining a vestibule (5) communicating with said cavity;
an injection piston (2) movable in said material cylinder for injecting material from said vestibule into said cavity;
material supply means (4) connected to said cylinder for supplying material to said vestibule;
hydraulic actuator means (8) operatively connected to said injection piston and to said cylinder for moving said injection piston;
control means (14) connected to said actuator means for actuating and controlling the pressure supplied by said actuator means during an injection phase (1) to move said injection piston to inject material into said cavity, during a means at the end of the dwell pressure phase used as an initial desired value for the solidification phase;
said control means further including holding means (39) for receiving and holding the measured actual pressure value of said second pressure monitoring means during the injection phase, and said pressure control means having a tool pressure controller (33) for switching the actuator means to a dwell pressure phase when an initial desired cavity pressure (21) is reached and for maintaining pressure value (69) of said second pressure monitoring means during said injection phase as an initial desired value for said dwell phase, said holding means holding at least one of an actual cylinder and vestibule pressure when at least a part of the material in the cavity solidifies, said actual value being used to control the actuator means for the solidification phase.

4,349,325

APPARATUS FOR MANUFACTURING PLASTIC PRODUCTS

William J. Mair, Merrow, Nr. Guildford, England, assignor to Plastic Recycling Limited, England

Division of Ser. No. 73,615, Sep. 10, 1979, Pat. No. 4,293,515.
This application Oct. 7, 1980, Ser. No. 194,873
Claims priority, application United Kingdom, May 11, 1979, 7916510
Int. Cl.³ A01J *21/00*
U.S. Cl. 425—363 **5 Claims**



1. Apparatus for manufacturing a plastics product from raw material containing at least 50% by weight of reclaimed synthetic thermoplastics material, comprising:
a first conveyor belt having an upstream and a downstream portion;
means for feeding a mat of the raw material in particulate form onto the first conveyor belt at the upstream portion thereof;
oven means arranged downstream of the raw material feeding means for heating the mat to cause the thermoplastics material in the mat to soften as the mat is passed through the oven means on the first conveyor belt;
three rollers arranged downstream of the oven means;
a second conveyor belt arranged to pass around the three rollers and to cooperate therewith for compressing the softened mat, the three rollers being arranged generally one above the other to define a first passage between the upper and middle rollers and a second passage between the middle and lower rollers, the middle and lower rollers being of substantially greater diameter than the upper roller; and
means for cooling the mat of material as it passes around at least one of said rollers.

4,349,326

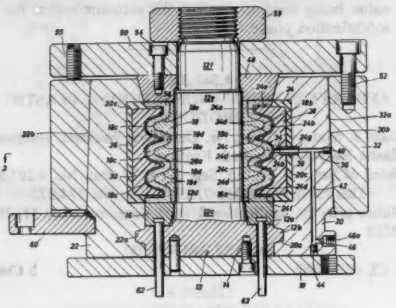
APPARATUS FOR MANUFACTURING ARTICLES BY PRESSING AND SINTERING

Robert D. Foster, 1116 Waugh Dr. #4, Houston, Tex. 77019, and Frank G. Weeden, P.O. Box 55156, Houston, Tex. 77055

Division of Ser. No. 951,717, Oct. 16, 1978, Pat. No. 4,252,760.
This application Oct. 27, 1980, Ser. No. 201,015
Int. Cl.³ B29C *6/02*
U.S. Cl. 425—405 R **7 Claims**

1. A press apparatus for forming a solid article from a particulate material comprising:
a supporting assembly;
a frangible backing member removably mounted on said supporting assembly and having a backing surface;

a pressing means mounted on said supporting assembly and having a pressing surface opposed to said backing surface, said supporting assembly being cooperative with said backing member and said pressing means to define a first chamber between said backing surface and said pressing surface for receipt of said particulate material, and said



pressing means being advanceable and retractable toward and away from said backing surface to contract and expand said first chamber;

closure means for selectively opening and closing said first chamber; and

means for selectively advancing and retracting said pressing means.

4,349,327

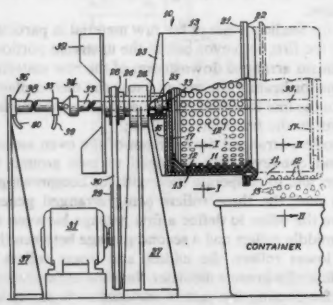
AUTOMATIC FINISHING CHIP MAKER

Günther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Dec. 4, 1980, Ser. No. 212,754

Int. Cl.³ B28B *1/08, 7/10, 13/00*

U.S. Cl. 425—436 R **27 Claims**



1. Apparatus suitable for the production of loose, particulate finishing chips for use in effecting vibratory, centrifugal, gyratory, or tumbling type finishing or the like, comprising:

a generally-cylindrical wall mounted for rotation about a central axis,

means for rotating said wall about said axis,

a generally-cylindrical sheetform flexible mold, having a plurality of cavities therein conforming to the desired configuration of the finishing chips desired to be produced, affixed to said wall at the outer periphery thereof and adapted to be located in one of two locations, the first of which locations is inside of said wall and adjacent the inside surface of said wall, in which location said wall is in mold-supportive position and said mold is in chip-molding position, and the second of which locations is an inside-out location generally outside of said wall and extending outwardly from the periphery thereof, in which location said mold is in chip-ejecting position, and

means for moving said flexible mold from said first location to said second location and vice-versa.

4,349,328

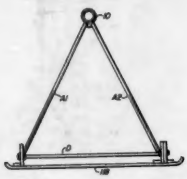
TRIANGULAR TRUSS CONCRETE SCREED HAVING A PAN FLOAT FINISHER ATTACHMENT

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Division of Ser. No. 34,171, Apr. 26, 1979, Pat. No. 4,316,715. This application May 15, 1981, Ser. No. 264,050

Int. Cl.³ E01C *19/38*

U.S. Cl. 425—456 **6 Claims**



6. A screed for finishing freshly poured concrete lying in an area between opposing side forms, said screen comprising:

a. a triangular truss frame having first and second ends and a top support member forming the apex of said triangular truss;

b. front and rear screed blades extending between the first and second ends of said frame and coupled in a spaced apart relationship to the lower portion of the front and rear of said frame, said front and rear blades each including a flat surface and forming the front and rear edges of said triangular truss frame;

c. means coupled to said screed for vibrating said front and rear blades;

d. first and second vertically oriented end brackets coupled to said top support member and to said front and rear screed blades at the first and second ends of said screed frame; and

e. a pan float finisher coupled to the flat lower surface of said front and rear blades and having a length substantially equal to the length of said frame and a width greater than the spacing between said front and rear blades, said pan float finisher forming a smooth surface parallel to the horizontal plane defined by the lower surfaces of said front and rear screed blades and including front and rear edges extending outward beyond said front and rear blades and curving upwardly.

4,349,329

EXTRUSION DEVICE FOR PRODUCING HONEYCOMB STRUCTURES

Junichiro Naito, Toyokawa; Shinichi Yamamoto, Takahama; Jitsuo Suzuki, Aichi, and Mitsuru Asano, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 2, 1981, Ser. No. 222,068

Claims priority, application Japan, Jan. 22, 1980, 55-6489

Int. Cl.³ B29F *3/04*; B29D *7/04*

U.S. Cl. 425—461 **8 Claims**

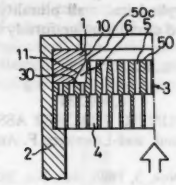
1. An extrusion device for producing honeycomb structure provided with walls of which thickness is larger in the outer peripheral portion thereof than in the central portion thereof, comprising:

a die provided with a large number of disconnected feed passageways which are formed on an extrudable material inlet side of said die in the axial direction thereof, and having

a large number of interconnected grid-shaped extrusion slots which are formed on an extrudable material outlet side of said die in said axial direction and communicated with said feed passageways;

said die being further provided with a stepped portion in the outer peripheral portion thereof;

the cross sectional area of each outlet opening of said extrusion slots positioned along the outer surface of an unstepped portion of said die being larger than that of the communicating portion thereof with each feed passageway;



an annular die mask having one end surface covering said extrusion slots of said stepped portion of said die on said extrudable material outlet side thereof; and

an annular pooling zone which is formed between said one end surface of said die mask and the opposed surface of said stepped portion of said die so as to surround said outer surface of said unstepped portion of said die;

said pooling zone being communicated with said extrusion slots.

4,349,330

COMBUSTION CONTROL DEVICE FOR NOZZLE SPRAY TYPE BURNER

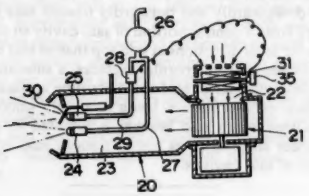
Akio Obinata, and Satoshi Ohsawa, both of Suzaka, Japan, assignors to Orion Machinery Co., Ltd., Nagano, Japan

Filed Jan. 3, 1980, Ser. No. 109,268

Claims priority, application Japan, May 2, 1979, 54-54424

Int. Cl.³ F23Q *9/08*; F23N *3/00*

U.S. Cl. 431—60 **5 Claims**



1. In a nozzle spray type of burner including a fuel source, a combustion chamber, a housing having an air passage therein coupled to said combustion chamber, a fan mounted in said housing for directing air through said air passage to said combustion chamber, fuel spray nozzle means in said air passage for spraying fuel provided by said fuel source into the flow of air in said air passage and including two fuel passageways for conducting the fuel between said fuel source and said fuel spray nozzle means, the improvement comprising a first mechanism associated with said fan for controlling the flow rate of the air in said air passage, said first mechanism comprising a butterfly valve mounted within said housing for movement over a certain path for regulating the flow of air into said air passage from outside said housing, a cam mounted for movement with said butterfly valve and a control switch arranged to be actuated by said cam when said butterfly valve is moved over a portion of the path of movement of said butterfly valve; and a second mechanism associated with said fuel spray nozzle means for controlling the amount of fuel sprayed into the flow of air in said air passage, said second mechanism including a switch valve arranged in at least one of said two fuel passageways and coupled to said control switch for controlling the flow of fuel in said fuel passageway in response to actuation of said control switch wherein the state of said first mechanism is detected by said second mechanism to control the degree of combustion of the fuel with the air in said combustion chamber.

4,349,331

FURNACE INSTALLATION INCLUDING FUEL MILLING AND BURNT PRODUCT COOLING AND METHOD OF OPERATING SAME

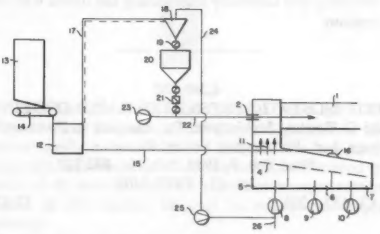
Hans-Joachim Flöter, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,263

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938144

Int. Cl.³ F27B *15/00*

U.S. Cl. 432—14 **8 Claims**



1. In a method of operating a kiln system including a firing kiln heated with pulverized fuel, an air cooled cooling device for the fired material and a crusher for the fuel, wherein at least a portion of the cooling air is led to the firing kiln as secondary air after passing through the cooling device and wherein the pulverized fuel is pneumatically taken via conveying air from the exhaust air of the cooling device from the crusher to a separator from where the greatest portion of the pulverized fuel is led to a burner before entering the kiln and, also the conveying air is drawn off together with a small portion of the pulverized fuel, the improvement comprising the step of supplying the conveying air containing the pulverized fuel to the cooling device as cooling air.

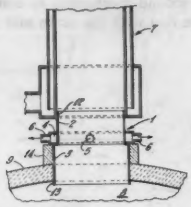
3. In a kiln system including a firing kiln heated by pulverized fuel burner, an air cooled cooling device for the fired material, conveying means for conveying cooling air to the cooling device, conveying means for conveying exhaust air from the cooling device to the firing kiln as secondary air, a fuel crusher, a conveying means for conveying exhaust air from the cooling device to the crusher, means for pneumatically conveying the pulverized fuel from the crusher to a separator, and means for conveying most of the pulverized fuel from the separator to a burner before entering the kiln, the improvement comprising means for supplying the conveying air together with a small portion of the pulverized fuel from the separator to the cooling device as cooling air.

4,349,332

CROWN VENTS

Edward C. Heubach, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 11, 1981, Ser. No. 242,812
Int. Cl.³ F27D *17/00*; C03B *5/16*; F27F *19/00*; F27B *7/00*
U.S. Cl. 432—179 **6 Claims**



1. Apparatus comprising:

(a) a recuperator;

(b) a furnace having a crown opening in its upper wall; and,

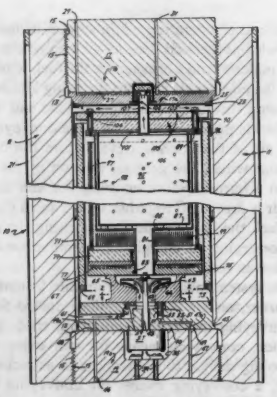
(c) a crown vent positioned therebetween comprising a conduit having a lower walled section of a first diameter and an upper contiguous walled section of a second diameter less than said first diameter and a conduit having a lowered wall positioned circumferentially of said upper section proximate the intersection of said upper and lower sections, the wall of said upper section forming the inner wall of said conduit and the wall of said lower section centrally and vertically intersecting the lower wall of said conduit.

4,349,333

HOT ISOSTATIC PRESS WITH RAPID COOLING

Arnold G. Bowles, Jenkintown, Pa., assignor to Pressure Technology, Inc., Huntingdon Valley, Pa.

Filed Feb. 9, 1981, Ser. No. 232,822
Int. Cl.³ F27B *5/04*
U.S. Cl. 432—205 **17 Claims**



1. An apparatus for the pressure heat treating and annealing of objects including the controlled uniform and rapid cooling thereof, comprising:

means for containing at least one object for treatment, said containing means including a cylindrical wall surrounding said object having a plurality of holes therein;

means for surrounding said containing means for heating said object contained therewithin;

means surrounding said heating means for holding a gas pressure established therewithin;

means within said pressure holding means and spaced therefrom for insulating said pressure holding means from said heating means;

means for evacuating said gas from said containing means, said evacuating means being at the center and top of said containing means; and

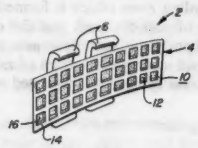
means for circulating said gas adjacent said pressure holding means surfaces for cooling said circulated gas thereby and for passing said cooled gas into said containing means through said cylindrical wall plurality of holes thereby causing a forced circulation uniformly about the inside of said cylinder.

4,349,334

ORTHODONTIC BRACKET ASSEMBLY

David E. Webb, Jamul, and Lawrence F. Andrews, San Diego, both of Calif.

Filed Nov. 3, 1980, Ser. No. 203,826
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—9 **8 Claims**



1. A cast orthodontic bracket for bonding to the surface of a tooth comprising:

an archwire bracket portion adapted to receive an archwire;

a pad portion attached to said archwire portion and having a tooth abutting surface opposite said archwire portion;

said tooth abutting surface having a plurality of cavities formed therein, said cavities having a top opening, a circumferential sidewall, and a bottom, said sidewall extending downwardly and outwardly toward said bottom and away from a central portion of said cavity so said cavity is smaller in all directions at said top than at said bottom; and

said cavities having irregular surfaces, a substantial portion of the remainder of said tooth abutting surface and of the surface of said bracket being relatively smooth surfaces produced when said bracket is tumbled in an abrasive medium adapted so as not to smooth said irregular surfaces of said cavities.

4,349,335

OVAL DENTAL ANCHOR

Bernard Weissman, New York, N.Y., assignor to Ipco Hospital Supply Corporation, White Plains, N.Y.

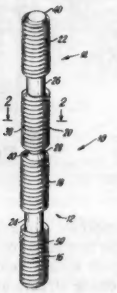
Continuation-in-part of Ser. No. 845,628, Oct. 26, 1977. This application Sep. 20, 1979, Ser. No. 77,400
The portion of the term of this patent subsequent to Jun. 29, 1997, has been disclaimed.
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—225 **4 Claims**

1. A dental anchor for insertion into channels in a tooth, said dental anchor comprising:

a first elongated body member, said first body member having at least one section with a substantially oval cross-sectional configuration having a major and minor axis to provide two angular side portions joined by two angular end portions, said at least one section being provided with thread means for self-tapping said one section into a first

channel when said body member is rotated about its longitudinal axis, said thread means having a root diameter less than the minor axis dimension and a crest diameter at least equal to the major axis dimension, whereby said side portions of said one section are spaced from walls of the first channel when said one section is seated in the first channel to reduce self-tapping stresses;

a second elongated body member along said longitudinal axis, said second body member having at least another section with a substantially oval cross-sectional configuration having a major and minor axis to provide another two angular side portions joined by another two angular end portions, said another section being provided with second thread means for self-tapping said another section into a second channel when said second body member is rotated about said longitudinal axis, said second thread means having a root diameter less than the minor axis dimension of the oval configuration of said another section and a



crest diameter at least equal to the major axis dimension of the oval configuration of said another section, whereby said another four side portions of said another section are spaced from walls of the second channel when said another section is seated in the second channel to reduce self-tapping stresses, and a frangible reduced thickness member connecting said body members together; and

each of said body members including a second section along said longitudinal axis and a reduced thickness portion disposed intermediate said sections of each said body members to permit said second sections to be bent relative to said one section and said another section respectively after said one section and said another section are seated in their channels respectively to provide anchoring portions for a superstructure, said reduced thickness portion of each of said body members having a thickness greater than any thickness of said frangible reduced thickness member.

4,349,336

SQUARE DENTAL ANCHOR

Bernard Weissman, New York, N.Y., assignor to Ipco Hospital Supply Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 845,628, Oct. 26, 1977. This application Sep. 20, 1979, Ser. No. 77,401

The portion of the term of this patent subsequent to Jun. 29, 1997, has been disclaimed.

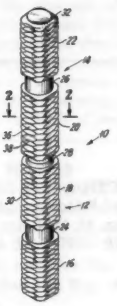
Int. Cl.³ A61C 5/04

U.S. Cl. 433—225 **4 Claims**

1. A dental anchor for insertion into channels in a tooth, said dental anchor comprising:

a first elongated body member, said first body member having at least one section with a substantially square cross-sectional configuration to provide four longitudinal substantially flat side surfaces joined by four longitudinal rounded corner portions, said one section being provided with thread means for self tapping said one section into a first channel when said body member is rotated about its longitudinal axis, said thread means having a root diameter approximately equal to the width dimension of the square configuration and a crest diameter less than the initial diagonal dimension of the square configuration, whereby said longitudinal side surfaces of said one section are spaced from walls of the first channel when said one section is seated in the first channel to reduce self tapping stresses;

a second elongated body member along said longitudinal axis, said second body member having at least another section with a substantially square cross-sectional configuration to provide another four longitudinally flat side surfaces joined by another four longitudinal rounded corner portions, said another section being provided with second thread means for self tapping said another section into a second channel when said second body member is rotated about said longitudinal axis, said second thread means having a root dimension approximately equal to the



width dimension of its square configuration and a crest diameter less than the initial diagonal dimension of its square configuration, whereby said another four longitudinal side surfaces of said another section are spaced from walls of the second channel when said another section is seated in the second channel to reduce self tapping stresses;

a frangible reduced thickness member connecting said body members together; and

each of said body members including a second section along said longitudinal axis and a reduced thickness portion disposed intermediate said sections of each of said body members to permit said second sections to be bent relative to said one section and said another section respectively after one section and said another section are seated in their channels respectively to provide anchoring portions for a superstructure, said reduced thickness portion of each said body members having a thickness greater than any thickness of said frangible reduced thickness member.

4,349,337

MARKSMANSHIP TRAINING SYSTEM

Herman I. Pardes, 45 Wickapecko Dr., Ocean, N.J. 07712

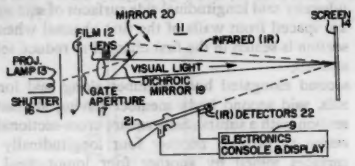
Filed Jul. 16, 1981, Ser. No. 283,776

Int. Cl.³ F41G 3/26

U.S. Cl. 434—20 **5 Claims**

1. A system for enabling marksmanship practice, comprising, in combination, a film frame projector providing visible and infrared light, a viewing screen, at least one apparatus simulating a weapon such as a rifle, a first infrared detector mounted on said weapon to receive infrared light beamed along the axis of said weapon, optical means for directing the images of a film to provide a composite visible scene and infrared target area on said screen at which said weapon may be aimed, and said screen reflecting said visible and infrared

light whereby said first infrared detector on said weapon responds to said infrared light when said weapon is accurately aimed and simultaneously fired at said target, and a second



infrared detector mounted off said axis and sensing infrared light from the scene adjacent said target whereby said second infrared detector provides an optical reference level for balancing background illumination.

4,349,338

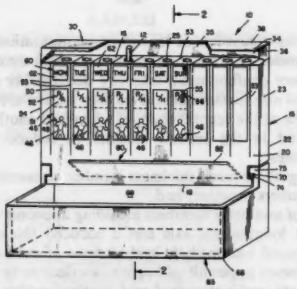
DAILY INJECTION SITE GUIDE ASSEMBLY

Fred A. Heppler, 3117 Falcon Ave., Medford, N.Y. 11763

Filed Jan. 16, 1981, Ser. No. 225,614

Int. Cl.³ G09B *23/28*; G09F *7/12*; A47B *81/00*; A61B *19/02*

U.S. Cl. 434—262 **32 Claims**



1. An injection site guide assembly for storing and dispensing of disposable syringes comprising in combination:

A. housing means having an upper end and spaced apart lower end,

B. holding means extending into said housing means at said upper end so as to permit the storing of a plurality of the syringes therein and the syringes are adapted to be individually removed as required for use thereof,

C. cover means adapted to be removably secured to said housing means at said upper end for enclosing said holding means,

D. indicating means on said housing means for illustrating various injection sites on the human body for use of the syringes,

E. retaining means associated with said housing means to accept disposable wipes or the like for use in conjunction with the syringes, and

F. container means removably secured to said housing means at said lower end thereof.

4,349,339

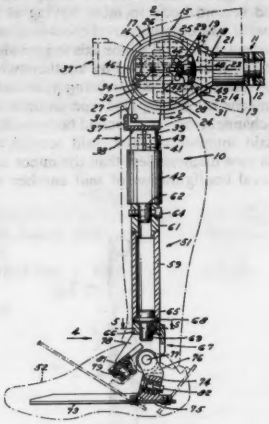
FORCE-INDICATING DUMMY LEGS

Roger P. Daniel, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1981, Ser. No. 288,873

Int. Cl.³ G09B *23/32*

U.S. Cl. 434—274 **7 Claims**



1. An anthropomorphic dummy leg for measuring essentially all of the forces that might be applied to a vehicle passenger's leg upon impact with a vehicle instrument panel, knee bolster or other vehicle structural member during a vehicle crash, comprising:

a dummy leg having a knee joint connecting femur and tibia bone simulations and an ankle joint connecting the tibia bone simulation and a simulated foot;

a plurality of load cells integrated with the femur and tibia bone simulations, the knee joint and ankle joint;

the tibia and femur load cells being capable of measuring a plurality of forces and moments acting on the femur and tibia bone simulations and the knee and ankle load cells being capable of measuring at least the axial loads resulting in knee shear load and upward ankle bending load.

4,349,340

MAN-PROPELLED HYDROFOIL BOAT

Benjamin Hoffmann, 4733 - 36th Ave. South, Minneapolis, Minn. 55406

Filed Mar. 6, 1980, Ser. No. 127,835

Int. Cl.³ B63H *16/14*

U.S. Cl. 440—30 **5 Claims**

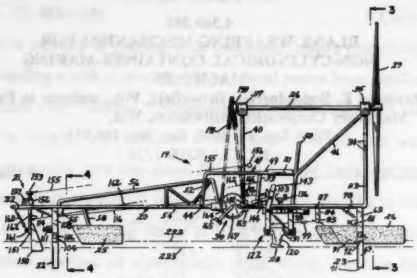
1. An occupant powered hydrofoil vehicle comprising, in combination:

a lightweight frame constructed from a plurality of interconnected tubular members, said frame including a forward end, a rearward end, and a seat disposed between the ends for supporting an occupant in a generally sitting position immediately above the surface of a body of water;

hydrofoil means depending from said frame for generating lift during vehicle movement, said hydrofoil means including a low-speed hydrofoil extending transversely generally beneath the seat on said frame, and constructed and arranged for primary use at low rates of vehicle movement, a first high-speed hydrofoil of generally V-shape configuration positioned at the forward end of said frame, and second and third high-speed hydrofoils positioned in laterally spaced apart relationship at the rearward end of said frame, said high speed hydrofoils being constructed and arranged for primary use at relatively higher rates of vehicle movement;

steering means including a rudder mounted on said frame for controlling directional movement of the vehicle, said steering means being adapted for manual actuation by the occupant;

means including a plurality of spaced apart hulls for supporting said frame at the surface of the body of water when said vehicle is stationary, said hydrofoil means being at least partially submerged in the body of water when said vehicle is stationary; and



drive means powered by the occupant for propelling said frame forward with respect to the body of water, said drive means including an air screw mounted behind the seat on the rearward end of said frame, and a transmission adapted for manual operation by the seated occupant for effecting rotation of said air screw, so that said frame and said hull means are lifted above the surface of the body of water by said hydrofoil means as the rate of vehicle movement increases.

4,349,341

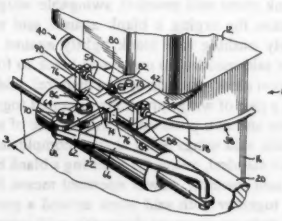
VANE STEERING SYSTEM FOR MARINE DRIVES

Edward J. Morgan, Fond du Lac, and Neil A. Rohan, Menasha, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 26, 1979, Ser. No. 106,833

Int. Cl.³ B63H *21/26*

U.S. Cl. 440—51 **13 Claims**



1. In a steering apparatus for a steerable marine drive, including a drive unit pivotally mounted on the transom of a boat for moving and steering the boat through the water, a steering arm means operatively associated with the drive unit for pivoting the drive unit, and a movable steering control means for the boat, wherein an improved steering system comprises:

a steering vane rotatably mounted on the drive unit for generating a hydrodynamic torque on the drive unit upon rotation of said vane with respect to the drive unit;

a vane rotating member coupled to said vane for rotating said vane responsive to tensile forces exerted thereon;

a pair of vane control cable means, each having a movable element with a first end and a second end, said first end being attached to said vane rotating member for exerting vane rotating tensile forces on said member by the movement of said element; and

a lever pivotally mounted on said steering arm means at a pivot point on said lever intermediate the ends of the lever, said lever having a forward lever arm extending in one direction from said pivot point toward one end of said lever, said forward lever arm receiving the steering control means, said lever having at least one rear lever arm extending from said pivot point in the opposite direction from said forward lever arm toward the other end of said lever, said rear lever arm being attached to the second ends of said control cable means elements for coordinately moving said elements to generate a tensile force in one of said control cable means elements and a release in the other control cable means element responsive to the movement of said lever by the steering control means, said lever pivot point being positioned intermediate the ends of the lever closer to the forward end than the rear end so as to provide a magnification of about 2:1 between the movement of the steering control means and the resulting magnified movement of the elements of said cable control means, said lever having means for limiting its pivotal movement with respect to the steering arm means to a predetermined amount and for coupling the steering control means to the steering arm means to move the steering arm means directed from the steering control means when the lever has reached the limit of pivotal movement.

4,349,342

CHAIN SHIFTING DEVICE

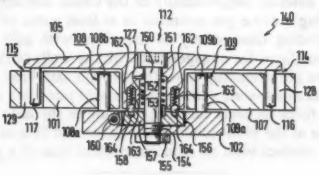
Hans-Joachim Schwerdhöfer, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,401

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2911970

Int. Cl.³ F16H *7/22*

U.S. Cl. 474—80 **16 Claims**



2. A chain shifting device for bicycles or the like having a remote-controlled chain guiding and tensioning mechanism having a number of positions so that in each position the chain can be shifted to a different chain wheel of a chain wheel set comprising a system including a movable joint block arranged to be connected to the chain guiding and tensioning mechanism, a fixed joint block arranged to be fixed to the bicycle frame, an articulated lever and a guide member guiding said movable joint block on said fixed joint block, a first joint connecting said articulated lever to said fixed joint block, a second joint connecting said articulated lever to said movable joint block, a third joint connecting said guide member to said fixed joint block, a fourth joint connecting said guide member to said movable joint block, a fifth joint connecting said articulated lever and guide member together between said fixed joint block and movable joint block, each of said first, second, third, fourth and fifth joints being rotatable and two of said joints each being slidable in a direction extending transversely of the axis of rotation of said joint, wherein the improvement comprises locking means for interlocking two parts of said system which are movable relative to one another for securing at least one position of the chain guiding and tensioning mechanism, said locking means comprises a spring-operated locking mech-

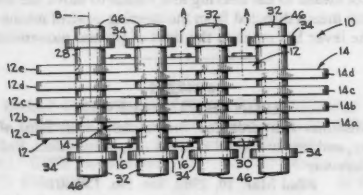
anism which releases the guiding movement of the chain guiding and tensioning mechanism when a predetermined actuating force is exceeded, said locking mechanism comprises a first part and a second locking part with said locking parts being movable relative to one another, and at least one said locking part arranged to be movable and adjustable relative to one of said articulated lever and guide member, one of said locking parts of said locking mechanism comprises locking recesses and said other locking part comprises at least one directionally biased locking projection for resilient engagement in said locking recesses, said articulated lever having a recess therein, said locking part containing said locking recesses being located in the recess in said articulated lever, and said locking part being adjustable relative to said articulated lever.

4,349,343

CHAIN FOR VARIABLE SPEED TRANSMISSION

Louis J. Stephanoff, Indianapolis, and Stellios A. Avramidis, Mooresville, both of Ind., assignors to PT Components, Inc., Indianapolis, Ind.

Filed Dec. 27, 1979, Ser. No. 107,757
Int. Cl.³ F16H *9/12, 9/24*
U.S. Cl. 474—245 **6 Claims**



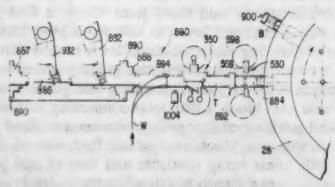
1. In a drive chain for a variable speed transmission having two spaced apart pulleys with conical faces to receive the drive chain, said chain having a plurality of links pivotally connected in end to end relation at pivot joints lying on a pitch line that extends longitudinally of the chain, the improvement comprising a drive pin mounted in at least some of said links and extending transversely of the chain with said drive pin having end faces for engagement with the walls of the pulleys, said drive pin extending laterally through said links and movable on its axis spaced vertically from said pitch line to provide a lateral force moment resisting twisting of the links about the pitch line at the pivot joints when either end face of the drive pin is in contact with an adjacent conical face of a pulley.

4,349,344

TUBE AND POUCH FORMING MANDREL ASSEMBLY

Jack R. Evers, Torrance, Calif., assignor to Developak Corporation, Redondo Beach, Calif.

Filed May 23, 1980, Ser. No. 152,756
Int. Cl.³ B31B *33/02*
U.S. Cl. 493—11 **12 Claims**



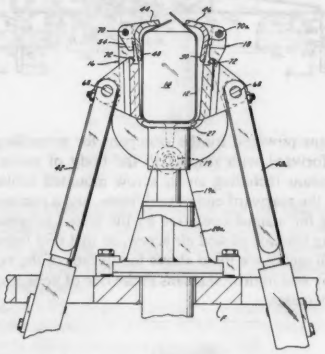
1. In a pouch forming apparatus for forming pouches from a printed web, a tube forming mandrel assembly, said mandrel assembly comprising a reciprocating mandrel, clamp means associated with said mandrel for periodically clamping a tube portion to said mandrel for movement therewith to advance an associated tube, drive means for repeatedly advancing and retracting said mandrel, and means for varying the advance stroke of said mandrel in response to actuation of said drive means to maintain registration of printing on said web with formed pouches.

4,349,345

BLANK WRAPPING MECHANISM FOR NON-CYLINDRICAL CONTAINER-MAKING MACHINES

Raymond E. Bodendoerfer, Brookfield, Wis., assignor to Paper Machinery Corporation, Milwaukee, Wis.

Filed Sep. 15, 1980, Ser. No. 186,911
Int. Cl.³ B31B *1/28*
U.S. Cl. 493—295 **8 Claims**



1. A machine for making generally rectangular in shape paper containers of the type having a successively indexable turret for presenting a workpiece to different stations, said turret having a rectangular in cross-section mandrel extending therefrom, said machine having a station for wrapping a preformed blank about said mandrel, swingable wing mechanism at said station for urging a blank against said mandrel and progressively pushing said blank tightly against and around each side of said mandrel to cause said blank to form an overlapped portion along one side of said mandrel, said mechanism comprising a pair of wings pivotably mounted together and on said machine and at a point adjacent one side of said mandrel at said station, said wings being shaped complementary to the shape of said mandrel, means for inserting a blank between said wings and said mandrel, power operated means for swinging said wings together with said blank around a portion of said mandrel in tight engagement therewith; said wings each having a supplement wing portion pivotably attached thereto for pivoting between (1) an open position away from one another to permit them to move unobstructively past said mandrel as said wings wrap said blank against said mandrel and (2) a position tightly pressing said blank against said mandrel and to form said overlapped portion of said container, said supplement wing portions being generally right angular in shape and each having an initial mandrel-contacting portion and a free end, said wing portion being pivotally attached to said wing at a point between said mandrel-contacting portion and said free end, whereby said mandrel-contacting part initially abuts against said mandrel to thereby force said supplement portions to pivot about said point to said position where they tightly press said blank against said mandrel to complete the forming of said blank therearound.

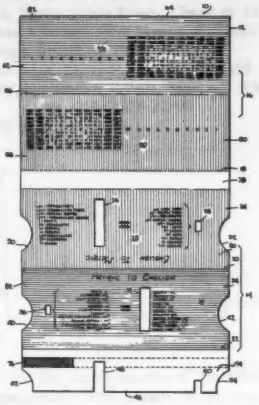
4,349,346

METHOD OF MAKING SLIDE CALCULATOR

Howard M. Bromberg, New York, N.Y., assignor to The Flexi-Group Inc., New York, N.Y.

Division of Ser. No. 944,281, Sep. 21, 1978, Pat. No. 4,220,075, which is a division of Ser. No. 701,082, Jun. 30, 1976, Pat. No. 4,132,348. This application Apr. 11, 1980, Ser. No. 139,260
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.³ B65D *27/04*
U.S. Cl. 493—325 8 Claims

1. A method of making slide calculator blanks comprising unwinding a web of predetermined lateral extent from a roll of foldable sheet material, continuously forming a separation line in the longitudinal direction of the web to divide the web longitudinally into elongated first and second leaf portions, continuously forming at least one longitudinal fold line in one of the leaf portions to define at least two longitudinal sleeve segment portions of substantially equal width, the fold line being formed substantially parallel to the longitudinal separation line, the other leaf portion representing the slide portion, and repetitively applying informational data portions on at least one surface of the web at the slide portion and at the two



sleeve segment portions to provide a plurality of connected slide calculator blanks on said web of foldable sheet material.

4,349,347

WOOL SCOURING

Merle S. Masri, Emeryville, Calif.; Brian Robinson, and James D. M. Gibson, all of Ilkley, England, assignors to Wool Development International Limited, London, England

Filed Sep. 5, 1980, Ser. No. 184,368

Claims priority, application United Kingdom, Sep. 7, 1979, 7931026

Int. Cl.³ D01C *3/00*

U.S. Cl. 8—139 10 Claims

1. In a method of scouring raw wool wherein scouring liquor is withdrawn from the scouring zone and passed through a circulatory system where it is treated to remove solid contaminants therefrom and subsequently recycled to the scouring zone, the improvement consisting essentially of adding a soluble alkali metal silicate to the scouring liquor prior to the separation of solid contaminants.

4,349,348

PROCESS FOR PRINTING SYNTHETIC, HYDROPHOBIC FIBER MATERIAL

Horst Tappe, Dietzenbach; Horst Kindler, Frankfurt am Main; Kurt Roth, Hofheim, and Hans-Jürgen Weyer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

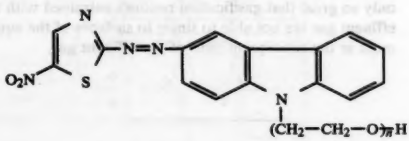
Filed May 18, 1981, Ser. No. 264,715

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019739

Int. Cl.³ D06P *5/15*

U.S. Cl. 8—464 8 Claims

1. In the process for the production of white or variously colored designs on a colored substrate on textile materials containing hydrophobic, synthetic fibers by impregnating the materials with dye liquors containing dyeing and padding auxiliaries as well as dyestuffs dischargeable to white, drying or incipiently drying the impregnated materials and then printing a desired pattern onto the materials with a discharge reserve paste containing a discharging agent, and subsequently subjecting the materials to a heat treatment at temperatures from 100° to 230° C., the improvement comprises the dyestuffs dischargeable to white being dyestuffs of the formula



wherein n is a number from 1 to 9; and said discharging agent being a base which produces a pH value of at least 8 in a 5% strength aqueous solution.

4,349,349

AQUEOUS LIQUID COMPOSITION OF REACTIVE DYE

Kiyoharu Nakatsuka, and Sadaharu Abeta, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 23, 1981, Ser. No. 246,858

Claims priority, application Japan, Mar. 31, 1980, 55/42411

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.³ D06P *67/00*

U.S. Cl. 8—527 8 Claims

1. An aqueous liquid dye composition containing 10 to 50 parts by weight of C.I. Reactive Blue 19, 1 to 40 parts by weight of a condensation product of formaldehyde with naphthalenesulfonic acid which may be alkylated, 0.1 to 10 parts by weight of a nonionic surfactant having an HLB of 9 to 20, and 20 to 80 parts by weight of water.

4,349,350

PROCESS FOR THE DETERMINATION OF URANIUM (VI) OR DIALKYL DITHIOPHOSPHORIC ACID PRESENT IN AN ORGANIC SOLVENT

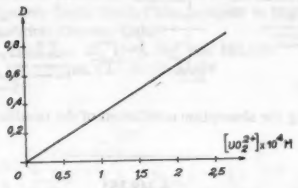
Richard Fitoussi, Paris; Sylvie Lours, Chatenay Malabry, and Claude Musikas, Villebon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 11, 1981, Ser. No. 242,655

Claims priority, application France, Mar. 17, 1980, 80 05908

Int. Cl.³ G01N *21/00*

U.S. Cl. 23—230 R 13 Claims



1. A process for the determination of the uranium (VI) or dialkyl dithiophosphoric acid present in an organic solvent comprising a neutral organophosphorus compound with an electron donor oxygen atom, wherein a dialkyl dithiophosphoric acid or a uranium (VI) salt is added to the organic solvent so as to convert all the uranium (VI) or dialkyl dithiophosphoric acid present in the solvent into a mixed uranium (VI)-dialkyl dithiophosphoric acid-organophosphorus compound complex and wherein the optical density of the solvent containing this complex in solution is measured so as to determine the concentration of the complex in the solvent, as well as its uranium or dialkyl dithiophosphoric acid content.

4,349,351

REAGENT FOR THE DETERMINATION OF HAEMOGLOBIN

Georg Frank, and Klaus Wehling, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,073

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024835

Int. Cl.³ G01N *33/72*

U.S. Cl. 23—230 B 4 Claims

1. In a reagent for the determination of haemoglobin consisting essentially of a solution in distilled or deionized water of potassium cyanide, potassium hexacyanoferrate-III, a buffer substance and a detergent, the improvement wherein the pH value is in the range of from 7.1 to 7.3 and the potassium cyanide concentration is in the range of from 90 to 120 mg/liter.

4,349,352

TEST FOR GLUCOSYLATED HEMOGLOBIN AND OTHER GLUCOSYLATED PROTEINS

James M. Manning, Tenafly, and Seetharama A. Acharya, Cresskill, both of N.J., assignors to Rockefeller University, New York, N.Y.

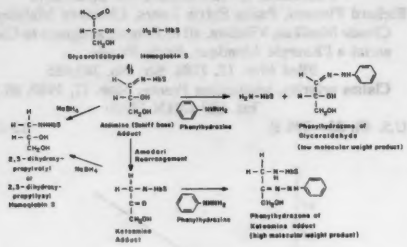
Filed Aug. 14, 1980, Ser. No. 178,068

Int. Cl.³ G01N *33/68, 33/72*

U.S. Cl. 23—230 B 8 Claims

1. A method for identification and assay of glucosylated blood proteins which comprises the steps of isolating purified

glucosylated blood protein, treating said isolated protein with a phenylhydrazine adapted to react therewith, and thereafter



measuring the absorption coefficient of the resulting phenylhydrazone.

4,349,353

FRYING OIL EVALUATOR METHOD AND COMPOSITION

Michael M. Blumenthal, Metuchen, N.J., and Jerry R. Stockler, Wantagh, N.Y., assignors to Oil Process Systems, Inc., Allentown, Pa.

Filed Sep. 25, 1981, Ser. No. 305,841
Int. Cl.³ G01N *33/02, 33/28*
U.S. Cl. 23—230 R **15 Claims**

1. A process for the determination of the amount of alkaline substances in fat, said process comprising the steps of:

(1) mixing a predetermined amount of a test solution with a predetermined amount of the fat, said test solution comprising pH indicator dye and a solvent; wherein the dye has a visible color change in the pH range of from about 2.5 to about 7.0, the dye is soluble in the solvent and the fat is substantially immiscible with the solvent; wherein the dye and solvent are present in amounts effective to provide said visible color change which depends on the amount of alkaline substances in the fat; and wherein the pH of the test solution is such that the color of the test solution prior to said mixing corresponds to the color of the dye at the lower end of the color change range for the dye;

(2) allowing the fat and test solution to separate into a solvent phase and a fat phase; and

(3) determining the amount of alkaline substances in the fat from the color developed in the solvent phase by comparing said developed color to a known standard.

4,349,354

FURNACE FOR GASIFYING GRANULAR FUELS

Wilhelm Flesch, Heidelberg, Fed. Rep. of Germany, assignor to Davy International Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 3,382, Jan. 15, 1979, abandoned. This application Jul. 16, 1980, Ser. No. 169,374
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801574
Int. Cl.³ C10J *3/56*
U.S. Cl. 48—77 **5 Claims**

1. A shaft furnace for gasifying fine-grained fuels such as coal or coke at normal or elevated pressure in a gasification zone comprising a fluidized bed and a diluted after-gasification zone above said bed with means for indirect cooling of the effluent gas in order to prevent gasification residues entrained with the gas from sintering to surfaces of the equipment in the subsequent path of the gas, said furnace comprising:

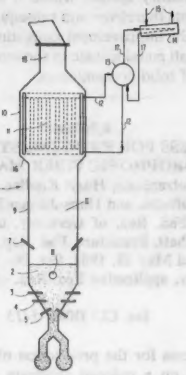
(a) a shaft section defining a fuel gasification zone, including

(1) an upper shaft section defining an after-gasification zone,

a lower shaft section below said after-gasification zone containing, a fluidized bed of granular fuel positioned and maintained in the lower portion of said fuel gasification zone and means for injecting a gasification agent into said fluidized bed;

(b) an upper enlarged cooling shaft section defining a gas cooling zone position above and in communication with said after-gasification zone, said gas cooling zone having a cross sectional area which is larger than that of said fuel gasification zone; and

(c) a radiation tube boiler for containing a small water content compared with the heat content of the fuel bed and forming part of a steam generation plant with the radiation



tube boiler surfaces being positioned completely within a recess formed by said enlargement of said gas cooling shaft section so that the boiler tube surfaces annularly surround effluent gases which pass through said upper shaft section, said boiler tube surfaces being positioned within said recess so that the reaction gas stream is not obstructed by said boiler tube surfaces as said gas stream moves through the cooling zone, said boiler tube surfaces further being dimensioned so that their cooling effect is only so great that gasification residues entrained with the effluent gas are not able to sinter to surfaces of the equipment in the subsequent path of the effluent gas.

4,349,355

METHANE GENERATOR

Banadakoppa T. Lingappa, and Yamuna Lingappa, both of 4 McGill St., Worcester, Mass. 01607

Filed Jul. 29, 1981, Ser. No. 287,767
Int. Cl.³ C02F *11/04*
U.S. Cl. 48—111 **10 Claims**

1. Methane generator, comprising:

(a) a tank having an open top,

(b) a gas collector vertically slidable in the tank,

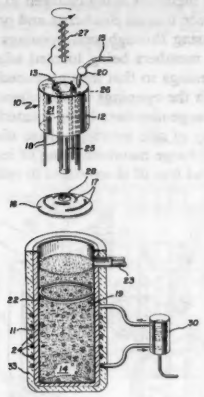
(c) feed means for introducing a slurry of liquid and raw solid organic material through the gas collector into the tank,

(d) conduit means for removing methane from the collector,

(e) a retainer located in the upper portion of the tank and extending horizontally across substantially the entire cross-section of the tank to maintain the solid organic material submerged in the slurry, the retainer having apertures, and

(f) rods extending downwardly from the collector and pass-

ing through the apertures in the retainer into the solids floating in the slurry beneath the retainer, wherein the gas



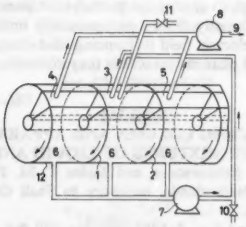
collector is free to rotate in the tank, and wherein the apertures in the retainer are concentric slots.

4,349,356

PROCESS AND APPARATUS FOR CONCENTRATING A COMPONENT OF A GASEOUS MIXTURE

Noriaki Wakao, Zushi, Japan, assignor to Toyo Engineering Corporation, Japan

Filed Feb. 14, 1980, Ser. No. 121,592
Claims priority, application Japan, Mar. 9, 1979, 54/26709
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—16 **3 Claims**



1. A process for concentrating a component of a gaseous mixture by Knudsen diffusion which comprises feeding a gaseous mixture is fed to one surface of a renewable portion of a porous membrane intermittently in the form of a pulse and collecting the gas diffused out of the opposite surface of said membrane under Knudsen's conditions during a transient period having length of not less than $x=0.01$ but not more than $x=0.4$, where $x=DT_2/aL$ wherein D is the intramembranous Knudsen diffusion coefficient, T is time (in seconds), a is the porosity of said membrane and L is the thickness (in cm) of said membrane, the collected diffused gas being hence enriched with the lighter component of said gaseous mixture.

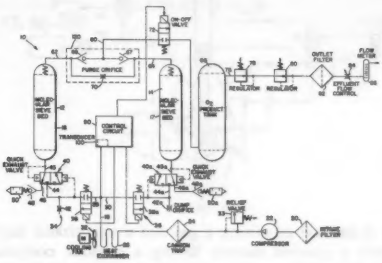
3. A continuous process for concentrating a component of a gaseous mixture by Knudsen diffusion which comprises feeding a gaseous mixture continuously to a gas-feeding zone having at least one boundary wall constituted of a porous membrane, moving said membrane so as to renew its portion to be contacted with said gaseous mixture at cyclic intervals of time of not less than $x=0.4$ but not more than $x=1$, where $x=DT_2/aL$ wherein D is the intramembranous Knudsen diffusion coefficient, T is time (in seconds), a is the porosity of said membrane and L is the thickness (in cm) of said membrane, whereby the lighter component of said gaseous mixture is preferentially diffused out of the opposite surface of said membrane under Knudsen's conditions and the heavier component thereby is largely left in said gas-feeding zone, and collecting the lighter component diffused out and the heavier component left in said gas feeding zone, respectively.

4,349,357

APPARATUS AND METHOD FOR FRACTIONATING AIR AND OTHER GASEOUS MIXTURES

George K. Russell, Castle Rock, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Jun. 23, 1980, Ser. No. 161,690
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—21 **35 Claims**



1. A method of fractionating a gaseous mixture containing at least first and second components, comprising the steps of passing the gaseous mixture containing said components alternately through first and second bodies of adsorbent to adsorb at least said first component but not said second component such that the unadsorbed gas leaving each of said bodies contains said second components, for a pre-selected time period starting with the initiation of the passage of the gaseous mixture alternately through said bodies, (a) passing all of the unadsorbed gas leaving said first body through said second body during the time in which the gaseous mixture is passing through said first body to purge adsorbed components from said second body and (b) passing all of the unadsorbed gas leaving said second body through said first body during the time in which the gaseous mixture is being passed through said second body to purge adsorbed components from said first body, and after expiration of said pre-selected time period, delivering a fraction of the unadsorbed gas leaving each body to a user and utilizing the remainder of the unadsorbed gas to purge said bodies of the adsorbed components.

3. In a heatless fractionating apparatus for fractionating a gaseous mixture having at least first and second components, at least one vessel, first means for pressurizing the gaseous mixture containing said components, a first valve connected intermediate said pressurizing means and said vessel and having fluid flow an inlet port for receiving the pressurized gaseous mixture, second means connected intermediate said pressurizing means and said inlet port for delivering the pressurized gaseous mixture to said inlet port, said first valve having a further fluid flow port in fluid communication with the interior of said vessel, and said first valve being responsive to the pressure of the pressurized gaseous mixture delivered to said inlet port for delivering the pressurized gaseous mixture through said further port to said vessel for flow through said vessel, said vessel containing an adsorbent for adsorbing at least said first component but not said second component of said gaseous mixture as the gaseous mixture flows through said vessel, said second means comprising a second valve responsive to a rise in the pressure of the gaseous mixture undergoing fractionation to a predetermined value for blocking the deliv-

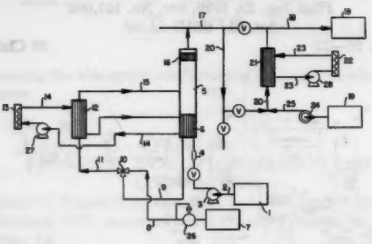
ery of the pressurized gaseous mixture to said inlet port, and third means rendering said second valve effective to vent gases from said vessel during the time when delivery of the pressurized gaseous mixture to said inlet port is blocked.

4,349,358

METHOD OF MIXING A GAS AND A VAPORIZABLE LIQUID

Gregorio Tarancon, Woodbridge, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1981, Ser. No. 247,947
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—89 6 Claims



1. A method of mixing a gas and a vaporizable liquid to provide a gaseous mixture having a constant composition, regardless of change in rate of flow, except as hereinafter provided, comprising:

(a) admixing the gas and the vaporizable liquid in predetermined proportions;

(b) introducing the mixture of step (a) at a predetermined pressure into the tube side of a tube and a shell heat exchanger at a flow rate sufficient to cause turbulent flow;

(c) introducing a heating fluid into the shell side of the heat exchanger at a temperature sufficient to vaporize at least part of the vaporizable liquid, separating the vaporizable liquid into a vapor phase and a liquid phase; and

(d) delivering the mixture of gas and vapor phase to a use point and recycling the liquid phase to step (a).

4,349,359

ELECTROSTATIC PRECIPITATOR APPARATUS HAVING AN IMPROVED ION GENERATING MEANS

Richard A. Fitch, La Jolla; James E. Drummond, Coronado, and Alfred A. Mondelli, Del Mar, all of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Division of Ser. No. 891,826, Mar. 30, 1978, Pat. No. 4,236,900, Continuation-in-part of Ser. No. 877,123, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 754,236, Dec. 27, 1976, abandoned. This application Apr. 14, 1980, Ser. No. 139,831
Int. Cl.³ B03C *3/40*
U.S. Cl. 55—151 10 Claims

1. Apparatus for precipitating particles from a gaseous medium carrying the same, comprising:

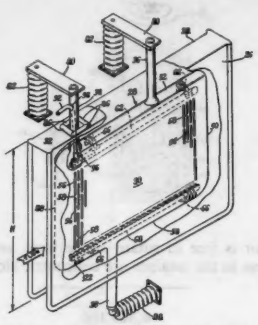
generally flat collecting plate means upon which particles are collected;

conductive shell means spaced from said collecting plate means, the space between said shell means and said collecting plate means defining a channel through which said medium passes, said shell means having at least one generally flat side wall, said side wall having a plurality of rows of openings therein, said rows being spaced from one another and oriented generally transversely of the flow of medium through said channel;

a plurality of corona discharge members located within said shell means aligned adjacent one another generally in a common plane and including interior corona discharge members and end discharge members;

said discharge members being charged to a sufficient potential to produce corona discharge and provide a supply of ions for passing through said openings into the channel, one of said members being located adjacent each of the rows of openings so that ions produced by each member pass through the openings of the adjacent rows;

said end discharge members being located on opposite ends of a plurality of said interior corona discharge members, said end discharge members being of increased cross-sectional size and free of sharp edges to reduce their proclivity to corona discharge relative to said interior corona discharge members to thereby compensate for the absence of mutual shielding produced by adjacent interior discharge members located on both sides thereof; and



said shell means being charged to a potential sufficient to maintain a strong generally uniform electric field between said shell means and said collecting plate means and said openings being sufficiently large to pass enough ions therethrough to charge the particles while not so large so as to significantly disrupt the generally uniform electric field, said electric field influencing said charged particles toward said plate means where they are collected thereon.

4,349,360

FLUID TREATING COLUMN AND APPARATUS FOR TREATING MIXTURES OF LIQUID AND GAS

Hubertus J. A. Schuurmans, and Andre T. M. Peer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 4, 1981, Ser. No. 270,304
Claims priority, application United Kingdom, Sep. 18, 1980, 8030134
Int. Cl.³ B01D *47/12, 45/08*
U.S. Cl. 55—238 5 Claims

1. An apparatus for treating a mixture of gas and liquid comprising:

a housing which surrounds a tubular inner wall that defines a generally vertical tubular inner space and a surrounding outer space within the housing;

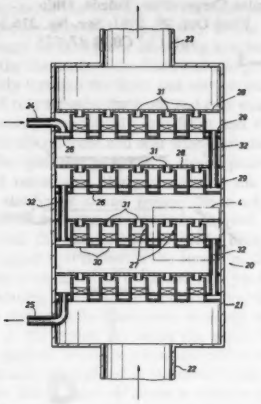
a top wall of the housing located above the top of the tubular inner wall so that fluid can flow between the surfaces of those walls;

inlet means for inflowing a mixture of gas and liquid into the bottom of the tubular inner space;

swirl-imparting means mounted within the tubular inner space for centrifugally separating said mixture into its gas and liquid components;

outlet means for discharging gas from the tubular inner space and said outer space including (a) a primary gas outlet tube which is coaxial with the tubular inner space, extends through the top wall of the housing and has a lower end which is smaller than the tubular inner space

and extends into a portion of that space below the top of the tubular inner wall, and (b) a secondary gas outlet tube which extends through the top wall of the housing and there communicates with the primary gas outlet tube and extends below the top of the housing and there opens over a portion of said outer space;



at least one opening through said tubular inner wall in a location above the swirl-imparting means, for discharging liquid from within the tubular inner space to within the said outer space; and,

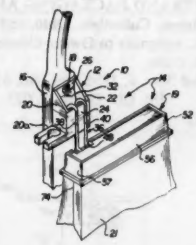
at least one opening through a lower portion of the housing for discharging liquid from within said outer space to a location outside the housing.

4,349,361

VACUUM CLEANER BAG HANGER ASSEMBLY

Ernest R. Scott, Mayfield Heights, and William D. Bowers, Avon, both of Ohio, assignors to The Scott & Fetzer Company, Lakewood, Ohio

Filed Oct. 5, 1981, Ser. No. 308,576
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—357 **10 Claims**



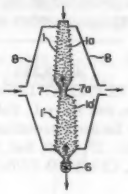
1. In an upright vacuum cleaner having a motor housing, a handle pivotally connected to said housing, and flexible dirt-receiving bag means extending between said housing and said handle, said bag means having rigid top casing means supporting said bag means, in combination therewith the improvement comprising a quick-connect-disconnect coupling between said handle and said housing, means to connect said bag means to said coupling and means to connect said bag means to said housing, said coupling including first and second coupling members, respectively, which are rigidly attached to said handle and said top casing means, respectively, with said second member rigidly supporting at least a major portion of said casing means as a cantilever, said first coupling member having means defining a pocket, said pocket-defining means including a fixed member and a member movable with respect to said fixed member, said movable member being biased toward said fixed member, said second member being releasably inserted between said fixed and movable members, means on said movable and fixed members cooperating with said second member to define a one-way ratchet which is releasable upon movement of said movable member away from said fixed member.

4,349,362

MULTI-STAGE MOVING BED TYPE ADSORPTION DEVICE

Itsuo Tanaka, Hiratsuka, and Hiromi Tanaka, Abiko, both of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,067
Claims priority, application Japan, Sep. 18, 1979, 54-118820
Int. Cl.³ B01D *53/06*
U.S. Cl. 55—390 **3 Claims**



1. A multi-stage, moving bed-type, adsorption apparatus, comprising:

a gas-circulating vessel having a gas inlet and a gas outlet for gas to be treated;

a plurality of adsorption chamber units, said adsorption chamber units being located inside said vessel between said gas inlet and said gas outlet, and filled with adsorbent particles and being arranged in vertical alignment one above the other so that adsorbent particles can flow downwardly through said units in series; each of said adsorption chamber units comprising opposed, upwardly extending, horizontally spaced-apart, front and rear, upper walls, said upper walls comprising louvers so that gas can be fed through the louvers in one of said upper walls and can be discharged through the louvers in the other of said upper walls, the upper ends of said upper walls being horizontally spaced from each other to define an inlet for said adsorbent particles, said upper walls diverging with respect to each other in the downward direction; opposed, horizontally spaced-apart, front and rear, lower walls extending downwardly from the lower ends of said front upper wall and said rear upper wall, respectively, said lower walls converging toward each other in the downward direction with the lower ends of said lower walls being horizontally spaced from each other to define an outlet for adsorbent particles; a pair of side walls extending between said front and rear, upper and lower walls at the opposite ends thereof, respectively, for closing the space therebetween so that said upper, lower and side walls define a chamber for containing said adsorbent particles; a horizontal rectifying body which is of inverted V-shape in cross section and a vertical rectifying plate extending downwardly from the apex of said rectifying body, said rectifying body and said rectifying plate being centrally located in the lower portion of said chamber between said front and rear lower walls and extending horizontally between said side walls; a coupling passage extending downwardly from the adsorbent outlet of each of said adsorption chamber units, except the lowermost one thereof, to the adsorbent inlet of the adjacent adsorption chamber unit located therebelow, each said coupling passage being located directly vertically below

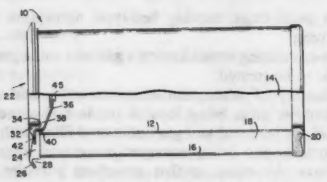
the rectifying body of the adsorption chamber unit disposed thereabove, each said coupling passage being defined by opposed, horizontally spaced-apart, front and rear, vertical walls which extend downwardly from the lower ends of the front and rear lower walls of the upper adsorption chamber unit to the upper ends of the front and rear upper walls of the adjacent lower adsorption chamber unit so that adsorbent particles leaving the adsorbent outlet of the upper adsorption chamber unit flow through said coupling passage into the adsorbent inlet of the adjacent lower adsorption chamber unit; the horizontal distance between said upper walls of each of said adsorption chamber units, except the uppermost adsorption chamber unit, being larger than the horizontal distance between said upper walls of the adjacent upper adsorption chamber unit at corresponding vertical locations in said units, so that the space velocity of the gas that flows through a lower adsorption chamber unit is lower than the space velocity of the gas that flows through the adjacent upper adsorption chamber unit; and an adsorbent particle discharging means provided at the adsorbent outlet of the lowermost adsorption chamber unit.

4,349,363

FILTER ELEMENT LEDGE GASKET

Jhina Patel, Eastlake, and Terry L. Zahuranec, Hudson, both of Ohio, assignors to Incom International Inc., Pittsburgh, Pa.

Filed Oct. 27, 1980, Ser. No. 200,794
Int. Cl.³ B01D *27/04, 46/02*
U.S. Cl. 55—498 **12 Claims**



1. In a filter element having an end retainer plate, an inner wall defining an axial cavity, an outer wall concentrically spaced about the inner wall, and a filter medium positioned between the inner and outer walls, the improvement comprising a gasket, said gasket comprising

an annular seal portion configured to extend across the space between the inner and outer walls and sealingly engage ends of the walls and retainer plate,

an annular lip extending outwardly from the seal portion and having an axially inward surface configurated to sealingly engage an edge of a housing receiving the filter element, and

an annular gripper portion extending inwardly from the seal portion and being spaced axially from the outer surface of the retainer plate to form a space between said gripper portion and the retainer plate sufficient to accommodate a fingertip.

8. In a filter element having an end retainer plate, an inner wall defining an axial cavity, an outer wall concentrically spaced about the inner wall, and a filter medium positioned between the inner and outer walls, the improvement comprising a gasket, said gasket comprising

an annular seal portion configured to extend across the space between the inner and outer walls and sealingly engage ends of the walls and retainer plate,

an annular lip extending outwardly from the seal portion, and

an annular gripper portion extending inwardly from the seal portion and being spaced axially from the outer surface of the retainer plate,

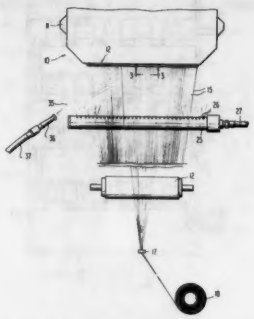
wherein the end of the retainer plate has a radial portion which is embedded in the seal portion and which extends at least partially across the space between the inner and outer walls.

4,349,364

MULTIPLE ORIFICE BUSHING

Michael W. Morrison, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 29, 1981, Ser. No. 316,244
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—2 **10 Claims**



1. A method of establishing filament flow from a bushing plate having tips having a plurality of orifices therein which comprises:

(a) flowing glass from a plurality of orifices in a bushing tip as a single fiber;

(b) directing a gaseous fluid into contact with said bushing plate;

(c) simultaneously directing a cooling liquid into contact with the tips of said bushing plate to cause said single filament to separate into individual filaments issuing from each of said orifices; and,

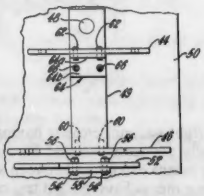
(d) discontinuing directing said cooling fluid into contact with the tips of said bushing while continuing to direct said gaseous fluid into contact with said bushing plate.

4,349,365

DUAL STRAND PACKAGING APPARATUS

Thomas O. Matteson, Columbus, Ohio, and David C. Wingate, Amarillo, Tex., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 6, 1981, Ser. No. 318,886
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—10.1 **6 Claims**



1. Dual strand packaging apparatus comprising a rotatably indexible turret, a pair of spaced, parallel elongated winding collets each rotatably mounted on the turret and movable alternatively into operating and standby positions oppositely to the other upon indexing of the turret, each collet being adapted to receive front and rear strand winding sleeves for the buildup of front and rear strand packages respectively thereon while the collet is in the operating position and each collet having a

front annular groove for temporarily receiving scrap strand windings, an elongated bushing disposed above the turret and collets for supplying molten glass streams for attenuation respectively into glass filaments by the winding action of a collet in the operating position, a longer dimension of the bushing extending transversely of the collets, front and rear gathering shoes disposed between the bushing and the collets in a manner enabling the filaments at the bushing to be divided equally into front and rear groups disposed respectively to the front and rear of an imaginary vertical plane extending longitudinally of the bushing and the filaments of the front and rear groups to be drawn respectively through the front and rear gathering shoes to form front and rear strands, the front and rear strands being adapted to be wound respectively into front and rear strand packages respectively on front and rear strand winding sleeves on a collet in the operating position, a strand push-off blade advanceable and retractable along a collet in the operating position, and a stationary strand release blade adjacent the strand push-off blade in a retracted position thereof, the strand push-off blade and the strand release blade being so constructed and arranged that (a) when the strand push-off blade is advanced upon completion of front and rear packages on a collet in the operating position, the front and rear strands are moved from the packages for temporary winding in the front annular groove of the collet, (b) when the turret is indexed with the strand push-off blade in advanced position, both the front and rear strands are trapped in the strand push-off blade, and (c) when the strand push-off blade is retracted, both the front and rear strands are pulled out of the front annular groove of the collet indexed to the operating position when the turret is indexed to trap the strands in the strand push-off blade, moved to the rear of the collet, and released from the strand push-off blade upon contact with the strand release blade.

4,349,366

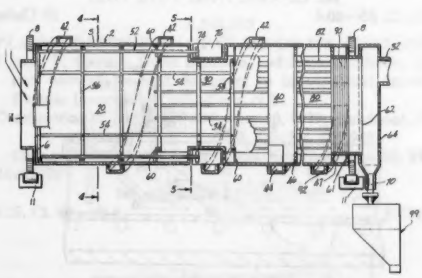
GLASS BATCH PELLET PRODUCTION AND DRYING PROCESS

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 123,153, Feb. 21, 1980, Pat. No. 4,293,324. This application Mar. 16, 1981, Ser. No. 244,457

Int. Cl.³ C03B *1/00, 3/00*

U.S. Cl. 65—27 **10 Claims**



1. A continuous process for the production of layered pellets for glass production, which comprises the following steps:

(a) maintaining a moving bed of recycle pellets in the pelletizing zone of a rotary apparatus;

(b) feeding sand and particles of a calcium carbonate source into said pelletizing zone;

(c) feeding a Na_2O source comprised of a solution of sodium hydroxide into said pelletizing zone, said recycle pellets being coated with a layer comprised of said solution of sodium hydroxide, said sand and said calcium carbonate source to thereby form layered pellets;

(d) passing said layered pellets into a heated drying zone to form dried layered pellets, said dried layered pellets having a residual moisture content of from about 4 to about 12 percent by weight;

(e) passing said dried layered pellets from the drying zone to a recycle zone;

(f) recycling a portion of said dried layered pellets to said pelletizing zone as said recycle pellets;

(g) recovering a portion of said dried layered pellets from said recycle zone; and

(h) feeding said recovered portion of layered pellets into a static bed dryer for preheating said pellets through a temperature range of approximately 100° F. to 1400° F. prior to feeding them to a glass furnace while maintaining the temperature differential between the surface of said pellets and the static bed drying gases in the range of 5° F. to 120° F. throughout said dryer.

4,349,367

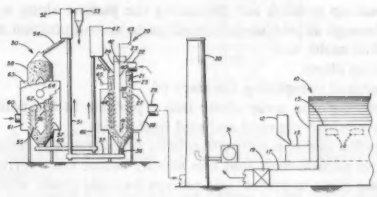
METHOD OF RECOVERING WASTE HEAT FROM FURNACE FLUE GASES USING A GRANULAR HEAT EXCHANGE MEANS

John F. Krumwiede, Blawnox, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1981, Ser. No. 249,311

Int. Cl.³ C03B *3/00*

U.S. Cl. 65—27 **25 Claims**



2. In a method of melting glass wherein glassmaking ingredients are fed into a melting furnace, air and fuel are directed into the furnace for combustion therein so as to heat and melt the glassmaking ingredients, and an exhaust gas stream is passed from the furnace, the improvement comprising:

passing at least a portion of the exhaust gas stream through a bed of granules in a first heat exchange vessel so as to heat the granules and extract heat from the exhaust gas, removing the heated granules from the bed and passing heated granules to a second heat exchange vessel, passing a stream of air into the second heat exchange vessel and into contact with the heated granules so as to heat the air by extracting heat from the granules, and passing the heated air from the second heat exchange vessel to the melting furnace for combustion.

4,349,368

GLASSWARE-MAKING APPARATUS WITH REJECT-CATCHING CHUTE AND METHOD OF OPERATING THE APPARATUS

Helmut Hüllen, and Werner-Dieter Knoth, both of Essen, Fed. Rep. of Germany, assignors to Veba Glas A.G., Essen, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,301

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020042

Int. Cl.³ C03B *9/195*

U.S. Cl. 65—28 **10 Claims**

1. An apparatus for making hollow glassware, said apparatus comprising:

a premold adapted to make a parison;

a final mold spaced from said premold and adapted to receive and blow-mold said parison;

means including an arm for removing a parison from said

premold and displacing the removed parison along a path through the air to said final mold; and

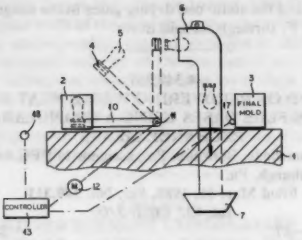
means including a scrap chute displaceable into a position along said path for intercepting said parison and receiving same from said arm.

7. A method of operating a glassware-making apparatus having:

a premold adapted to make a parison,

a final mold spaced from said premold and adapted to receive and blow-mold the parison,

an arm for removing the parison from the premold in a



pick-up position and displacing the parison along a path through an intermediate position to an end position at the final mold, and

a scrap chute,

said method comprising the steps of:

displacing said scrap chute into a position in the path between said premold and said final mold;

arresting said arm and substantially simultaneously releasing said parison from said arm shortly before same arrives at said chute to project said parison into said chute, whereby when said final mold is not ready to receive said parison same can be intercepted by said chute.

4,349,369

PROCESS FOR COATING GLASS

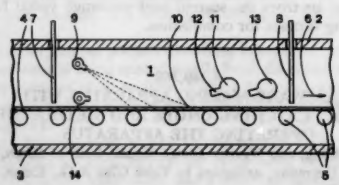
Robert Van Laethem, Loverval; Albert Van Cauter, Charleroi, and Robert Terneu, Thimeon, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,232

Claims priority, application United Kingdom, Jan. 31, 1980, 8003382

Int. Cl.³ C03C *17/00, 17/10, 17/25*

U.S. Cl. 65—60.4 20 Claims



1. In a process of forming a metal or metal compound coating on a face of a heated glass substrate during its displacement in a given direction, constituting the forward direction of displacement, by contacting such face, at a coating station through which the substrate passes, with at least one stream of droplets composed of at least one substance from which the coating metal or metal compound is formed on the face, the improvement comprising repeatedly displacing said stream of droplets along a transverse path across the substrate, and propelling gas unidirectionally forwardly or rearwardly across said transverse path, out of line with said droplet stream.

4,349,370

PROCESS FOR COATING GLASS

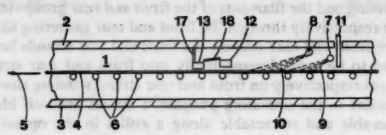
Robert Terneu, Thimeon, Belgium, assignor to BFG Glassgroup, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,234

Claims priority, application United Kingdom, Jan. 31, 1980, 8003358

Int. Cl.³ C03C *17/00, 17/10, 17/25*

U.S. Cl. 65—60.4 20 Claims



1. In a process of forming a metal or metal compound coating on a face of a heated glass substrate during its displacement in a given direction, constituting the forward direction of displacement, along a tunnel by contacting the substrate at a coating station in said tunnel with at least one stream of droplets composed of at least one substance from which said coating metal or metal compound is formed on said face, and simultaneously exerting suction forces in exhaust ducting to draw environmental gases away from that station, the improvement wherein said step of exerting suction forces is carried out by means of exhaust ducting composed of at least one exhaust duct whose entrance is located in said tunnel and is spaced parallel to the given direction from said coating station, and a barrier wall located so as to prevent gases from passing over said duct, towards and into contact with the droplet stream.

4,349,371

PROCESS FOR COATING GLASS

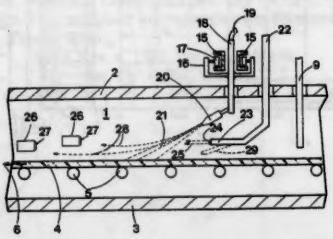
Robert Van Laethem, Loverval; Albert Van Cauter, Charleroi, and Robert Terneu, Thimeon, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,235

Claims priority, application United Kingdom, Jan. 31, 1980, 8003357

Int. Cl.³ C03C *17/00, 17/10, 17/25*

U.S. Cl. 65—60.4 25 Claims



1. In a process of forming a metal or metal compound coating on a face of a heated glass substrate during its displacement in a given direction, constituting a forward direction of displacement, by contacting such face, at a coating station through which the substrate passes, with at least one stream of droplets composed of at least one substance from which said coating metal or metal compound is formed on said face, the improvement comprising causing said stream of droplets to travel downwardly at an inclination to a direction parallel to the forward direction, discharging at least one current of preheated gas into the environment above the substrate so that such gas flows in said direction parallel to the forward direc-

tion above the substrate and into contact with said stream, and regulating the temperature of such gas current such that said current influences the temperature of droplets of said stream on their way to the substrate.

4,349,372

PROCESS FOR COATING GLASS

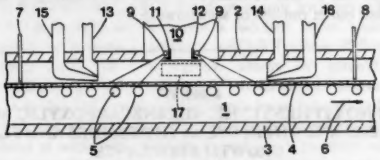
Robert Van Laethem, Loverval; Albert Van Cauter, Charleroi, and Robert Terneu, Thimeon, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,236

Claims priority, application United Kingdom, Jan. 31, 1980, 8003354

Int. Cl.³ C03C *17/00, 17/10, 17/25*

U.S. Cl. 65—60.4 33 Claims



1. In a process of forming a metal or metal compound coating on a face of a heated glass substrate during its displacement in a given direction through a coating station at which the said face is contacted with at least one stream of droplets composed of at least one substance from which said coating metal or metal compound is formed on said face, such at least one stream being directed at a downward inclination to such face, the improvement comprising directing the stream downwardly towards said face at an inclination to a direction parallel to the given direction, causing at least one current of gas, constituting a counter-current, to flow adjacent the substrate path and towards the portion of the droplet stream where the droplets have the longest trajectories, and exerting suction force on the gases in exhaust ducting whose entrance is located for drawing gases away from said portion of said stream at a higher level.

4,349,373

PLASMA DEPOSITION OF GLASS OR ITS PRECURSOR

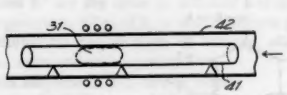
Henley F. Sterling, Great Dunmow, and Miles P. Drake, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 37,790, May 10, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,948

Claims priority, application United Kingdom, May 30, 1978, 24187/78

Int. Cl.³ C03C *17/02, 17/245*

U.S. Cl. 65—60.8 8 Claims



1. A method of depositing a glass or its precursor on a substrate surface by a radio frequency induced chemical vapor reaction using an inductively maintained plasma fed with gas at a pressure within the range 0.1 to 50 Torr, wherein stray capacitive discharges are eliminated from unreacted gases and wherein the plasma discharge is such that its largest dimension is significantly less than the free space wavelength of the radio frequency employed to maintain the plasma, the plasma pressure and energy density being such that the deposit is non-porous.

3. The method as claimed in claim 1 and in which the plasma is localized by means of an RF step down transformer or concentrator.

4,349,374

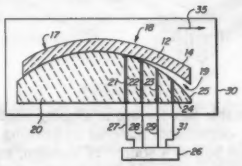
METHOD AND APPARATUS FOR MANUFACTURING GLASS PROGRESSIVE LENSES

Wiktor J. Rupp, Hollywood, Fla., assignor to Camelot Industries Corporation, Burlington, Mass.

Filed Jan. 21, 1981, Ser. No. 226,965

Int. Cl.³ C03B *23/00*

U.S. Cl. 65—107 13 Claims



1. A method for manufacturing a glass lens having a spherical distance portion and a nonspherical progressive portion comprising:

a. providing a forming block having a lens forming surface shaped for forming said spherical and nonspherical surfaces on a lens;

b. supporting a glass lens blank on said forming surface, said lens blank and said forming surface defining a spacing therebetween adjacent the non-spherical portion;

c. heating said glass lens blank to its softening point;

d. simultaneously establishing a pressure differential between the opposite sides of said lens blank for causing said lens blank to sag against said forming surface by locating openings through the forming block progressing from the vicinity of where said spacing between said lens blank and said forming surface is initially relatively narrow and ending in the vicinity of where said spacing is initially relatively wide; and

e. coupling said apertures to a pump.

6. Apparatus for manufacturing a glass lens having a spherical distance portion and a nonspherical progressive portion comprising:

a. a lens forming block having a lens forming surface shaped to form said spherical and nonspherical lens portions;

b. a lens blank adapted to be situated above said lens forming block and supported on said lens forming surface, said lens blank and said lens forming surface defining a spacing therebetween adjacent the nonspherical portion;

c. means for heating said lens blank to its softening point; and

d. means for establishing a pressure differential between the opposite sides of said blank for causing said lens blank to sag against said lens forming surface, said pressure differential establishing means comprising progressive apertures extending through said lens forming block for maintaining a relatively large pressure differential in the vicinity of where said spacing is relatively narrow so that said blank will sag progressing from where said spacing is relatively narrow and ending in the vicinity of where said spacing is relatively wide.

4,349,375

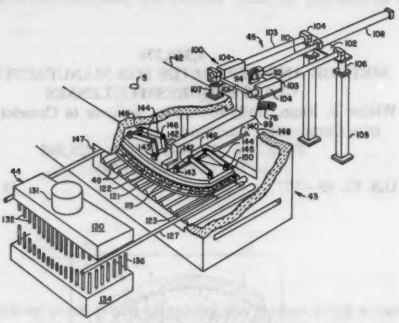
DEFORMABLE VACUUM MOLD FOR SHAPING GLASS SHEETS

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 131,337, Mar. 18, 1980, Pat. No. 4,297,118. This application Oct. 23, 1981, Ser. No. 314,291

Int. Cl.³ C03B *25/035*

U.S. Cl. 65—291 **14 Claims**



1. A deformable box for use in shaping sheets composed of glass or other deformable material comprising means adapted to connect said box to a source of vacuum, an upper flexible sheet of fluid-impervious material, an apertured lower flexible sheet of fluid-impervious material, and means to distort said box from a flat configuration to a desired curved configuration when vacuum is applied thereto and a hot sheet of deformable material is held against said apertured, lower flexible sheet, characterized by a plurality of openwork plates of thin flexible material interposed between said upper flexible sheet and said lower flexible sheet, said plates composed of a material capable of sliding relative to said other plates and said upper and lower flexible sheets over a wide range of temperatures ranging from room temperature to the softening point of said deformable material, attachment means extending through said upper flexible sheet, said lower flexible sheet and said openwork plates constructed and arranged to permit said openwork plates to slide relative to one another and to said upper and lower flexible sheets when said deformable box is distorted, thereby avoiding distortion of said lower flexible sheet from a desired shape when said box is distorted, whereby when a flat hot sheet of deformable material engages said apertured, lower flexible sheet by vacuum while said deformable box is flat, said hot sheet of deformable material deforms with the deformation of said deformable box to said desired shape and is released from said deformable box when said application of vacuum is discontinued.

4,349,376

LIQUID COOLED SKIMMER

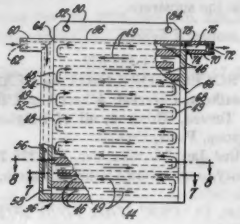
Charles S. Dunn, Pataskala, and Charles M. Hohman, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 8, 1981, Ser. No. 271,459

Int. Cl.³ C03B *5/20*

U.S. Cl. 65—345 **10 Claims**

1. A skimmer for use in a throat of a melting furnace, said skimmer comprising: a plate having a plurality of passages therein, said passages being through said plate from a first side to a second side with adjacent passages being in communication with each other, thereby forming a continuous passage through said plate; a first means attached to said plate for blocking the ends of said passages on said first side of said plate; a second means attached to said plate for blocking the ends of said passages on said second side of said plate; a first port means in communication with a first end of said continuous passage for connecting with a coolant inlet outside of said



furnace; and a second port means in communication with a second end of said continuous passage for connecting with a coolant outlet outside of said furnace.

4,349,377

PHENOXYPHENYLTHIOALKANECARBOXYLIC ACID AMIDES AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULANTS

Dieter Dürr, Bottmingen; Otto Rohr, Therwil, both of Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Beat Böhner, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 55,675, Jul. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 921,931, Jul. 3, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,608

Claims priority, application Switzerland, Jul. 7, 1977, 8426/77; Jan. 27, 1978, 9261/78

Int. Cl.³ A01N *31/08;* C07C *103/22*

U.S. Cl. 71—98 **6 Claims**

1. The compound α-[3-(2',4'-dichlorophenoxy)-6-chlorophenylthio]-propionic acid 2''-methoxyethylamide.

4,349,378

COMPOUNDS USEFUL AS PESTICIDES

Geoffrey R. Cliff, Whittlesford; Russell G. Hunt, Burwell, and Albert Percival, Hauxton, all of England, assignors to FBC Limited, Hauxton, England

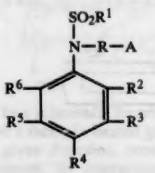
Filed Dec. 14, 1978, Ser. No. 969,492

Claims priority, application United Kingdom, Jul. 25, 1978, 31015/78

Int. Cl.³ A01N *41/00, 41/06;* C07C *143/74*

U.S. Cl. 11—103 **20 Claims**

1. A compound which is a sulphonanilide of formula



or salt thereof, wherein R^1 represents alkyl of 1–15 carbon atoms; alkyl of 1–15 carbon atoms substituted by one or more of halogen, alkoxy of 1–6 carbon atoms, hydroxy, amino and amino mono- or di-substituted by roups selected from alkyl of 1–15 carbon atoms; cycloalkyl of 3–7 carbon atoms; phenyl; phenyl substituted by one or more of halogen, alkyl of 1–6 carbon atoms and nitro; or a group of formula

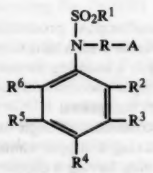
where R^7 and R^8 are the same or different and each represents a hydrogen atom, alkyl of 1–15 carbon atoms, phenyl, or phenyl substituted by one or more of halogen, alkyl of 1–6 carbon atoms, nitro and trifluoromethyl;

R represents alkylene of 1–6 carbon atoms;

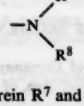
A represents —COR^{12} where R^{12} represents lower alkyl or lower alkyl substituted by one or more of halogen, hydroxy alkoxy of 1–6 carbon atoms; and

R^2, R^3, R^4, R^5 and R^6 are the same or different and each represents a hydrogen atom; alkyl of 1–15 carbon atoms; alkyl of 1–15 carbon atoms substituted by one or more of halogen and alkoxy of 1–6 carbon atoms; hydroxy; alkoxy of 1–6 carbon atoms; nitro; a halogen atom; amino; a group of formula —SR^{16} or —SO_2R^{16} where R^{16} represents alkyl of 1–6 carbon atoms or phenyl; or —$SO_2NR^7R^8$ where R^7 and R^8 are as defined above.

12. A method of combatting pests at a locus infested or liable to be infested with them or of regulating the growth of a plant at a locus at which the plant is growing or is to grow, which method comprises the step of applying to the locus a pest-combatting or plant growth regulant amount of a compound which is a sulphonanilide of formula:



or salt thereof, wherein R^1 represents alkyl of 1–15 carbon atoms; alkyl of 1–15 carbon atoms substituted by one or more of halogen, alkoxy of 1–6 carbon atoms, hydroxy, amino and amino mono- or di-substituted by groups selected from alkyl of 1–15 carbon atoms; cycloalkyl of 3–7 carbon atoms; phenyl; phenyl substituted by one or more of halogen, alkyl of 1–6 carbon atoms and nitro; or a group of formula



wherein R^7 and R^8 are the same or different and each represents a hydrogen atom, alkyl of 1–15 carbon atoms, phenyl, or phenyl substituted by one or more of halogen, alkyl of 1–6 carbon atoms, nitro and trifluoromethyl;

R represents alkylene of 1–6 carbon atoms;

A represents —COR^{12} where R^{12} represents lower alkyl or lower alkyl substituted by one or more of halogen, hydroxy alkoxy of 1–6 carbon atoms; and

R^2, R^3, R^4, R^5 and R^6 are the same or different and each represents a hydrogen atom; alkyl of 1–15 carbon atoms; alkyl of 1–15 carbon atoms substituted by one or more of halogen and alkoxy of 1–6 carbon atoms; hydroxy; alkoxy of 1–6 carbon atoms; nitro; a halogen atom; amino; a group of formula —SR^{16} or —SO_2R^{16} where R^{16} represents alkyl of 1–6 carbon atoms or phenyl; or —$SO_2NR^7R^8$ where R^7 and R^8 are as defined above.

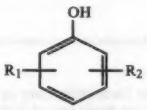
4,349,379

EMULSIFIABLE CONCENTRATE FOR WEED CONTROL

Fumio Horide; Kozo Tsuji, both of Osaka, and Ryo Yoshida, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 26, 1980, Ser. No. 210,791
Claims priority, application Japan, Nov. 26, 1979, 54-153224
Int. Cl.³ A01N *25/02*
U.S. Cl. 71—120 **3 Claims**

1. An emulsifiable concentrate for weed control, which comprises 10 to 40 parts by weight of N'-[4-(4-methylphenethyloxy)phenyl]-N-methoxy-N-methylurea, 5 to 20 parts by weight of an emulsifier, 5 to 35 parts by weight of at least one phenolic solvent of the formula:



wherein R_1 and R_2 are each hydrogen or methyl, and 5 to 80 parts by weight of at least one aromatic hydrocarbon solvent having 6 to 11 carbon atoms.

4,349,380

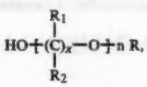
METHOD OF RECOVERING METALS FROM METAL CONTAINING MATERIALS

Louis L. Pytlewski, and Kenneth Krevitz, both of Philadelphia, Pa., assignors to The Franklin Institute, Philadelphia, Pa.

Filed Apr. 1, 1981, Ser. No. 250,009
Int. Cl.³ C22B *11/04, 15/12, 23/04*
U.S. Cl. 75—0.5 A **7 Claims**

1. A method for recovering a metal that is lower than the alkali metals in the electromotive force series from a material containing said metal in chemically combined form, said method comprising:

a. providing a reagent comprising the product of the reaction of an alkali metal or alkali metal hydroxide, a reactant having the general formula



wherein R is hydrogen or lower alkyl, R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, unsubstituted or substituted lower alkyl, unsubstituted or substituted cycloalkyl having from 5 to 8 carbon atoms, and unsubstituted or substituted aryl, n has a value from about 2 to about 400 and x has a value of at least 2, and oxygen;

b. contacting said decomposition reagent with said metal-containing material; and

c. recovering the free metal.

4,349,381

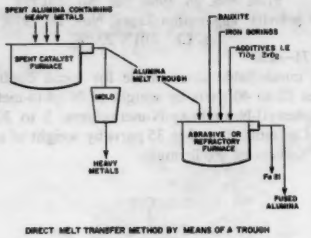
RECOVERY OF HEAVY METALS FROM SPENT ALUMINA

Paul Cichy, Buffalo, N.Y., assignor to Kennecott Corporation, Stamford, Conn.

Filed Sep. 30, 1980, Ser. No. 192,390
Int. Cl.³ C22B *4/00*
U.S. Cl. 75—10 R **7 Claims**

1. A method of recovery of heavy metal and alumina from spent alumina comprising melting spent alumina comprising alumina and heavy metal in a first electrode arc furnace, separating molten alumina by pouring from the upper portion of the melt into a transport means, passing said molten alumina

from said transport means into a second electrode arc furnace, adjusting the composition of said molten alumina in said second arc furnace such that the refined alumina is suitable for abrasives or refractories, withdrawing refined alumina from



DIRECT MELT TRANSFER METHOD BY MEANS OF A TROUGH

said second furnace to form refractory or abrasive materials by casting from said second furnace and withdrawing heavy metal remaining in said first furnace after removal of said molten alumina.

4,349,382

PROCESS FOR REFINING OF A BATH OF METAL CONTAINING COLD SOLID SUBSTANCES

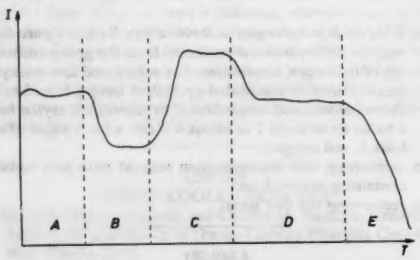
Francois Schleimer, Dudelange; Romain Henrion, Esch; Ferdinand Goedert, Dudelange, and Lucien Lorang, Differdange, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Apr. 28, 1980, Ser. No. 144,228

Claims priority, application Luxembourg, Apr. 30, 1979, 81207

Int. Cl.³ C21C *5/32, 5/34*

U.S. Cl. 75—60 **11 Claims**



1. A process for refining iron melts by blowing oxygen on top of a melted bath in a converter containing cooling matter and by distributing sufficient amounts of oxygen over the bath surface, which process comprises promoting postcombustion of CO above the bath level by actively regulating the thickness and consistency of the slag formed over the disequilibrium level between said slag and the bath by injecting an unreactive gas into the melt through the bottom of the bath, so as to prevent the formation of a thick layer of slag with a foamy consistency.

4,349,383

METHOD FOR THE PYROMETALLURGICAL PRODUCTION OF COPPER

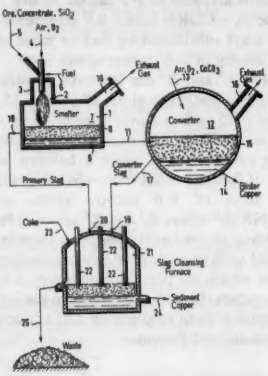
Kiranendu B. Chaudhuri, Troisdorf, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 193,021

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941225

Int. Cl.³ C22B *15/04*

U.S. Cl. 75—73 **1 Claim**



1. In a method for the pyrometallurgical production of copper from a copper bearing source in which said source is smelted into matte and primary slag in a smelting process and the matte is converted into blister copper and converter slag in a converter, the improvement which comprises:

carrying out the smelting under conditions of high oxygen potential to produce a matte having a copper content of from 60 to 80% and a primary slag having a copper content of from 3 to 7%,

combining said primary slag and said converter slag,

reducing the combined slags in a reduction zone by blowing reducing gases substantially perpendicular to the molten slags under sufficient gas velocity to generate a rotating, substantially toroidal layer, and continuing the reducing treatment until the reduced slags have a copper content of less than 0.5%.

4,349,384

METHOD FOR THE MANUFACTURE OF SEGMENTS FOR COMMUTATORS

Hans Weinert, W.-Niederbachem, Fed. Rep. of Germany, assignor to Ringsdorff-Werke GmbH, Bonn, Fed. Rep. of Germany

Filed Jun. 27, 1980, Ser. No. 163,731

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929731

Int. Cl.³ B22F *7/02*

U.S. Cl. 75—208 R **10 Claims**

1. Method for the manufacture of segments having a base part of copper and an upper layer of carbon joined to the base part, for a commutator, which comprises:

(a) placing a first layer of copper powder and on top thereof a second layer of a mixture consisting entirely of carbon powder and a pyrolyzable, carbonaceous binder into a die with a cavity shaped like the segment,

(b) densifying the powder layers to produce a blank having the form of the segment,

(c) sintering the blank at an elevated temperature to cause

the powder particles to cohere and the layers to firmly join together, and

(d) providing the base part with recesses for receiving insulating material.

4,349,385

METHOD OF PREPARING A FEOOH PIGMENT

Hendrikus F. Huisman, and Harm Jan Groen, both of Oosterhout, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,259
Claims priority, application Netherlands, Feb. 23, 1979, 7901438
Int. Cl.³ B32B *15/04;* C09K *3/00*
U.S. Cl. 106—37 9 Claims

1. A method of processing FeOOH particles comprising the steps of:

preparing an aqueous dispersion of FeOOH particles;

separating the FeOOH particles from the aqueous dispersion;

washing the separated FeOOH particles with water; and

drying the washed FeOOH particles;

CHARACTERIZED IN THAT prior to separating the FeOOH particles from the aqueous dispersion, a water-soluble ammonium salt, which is derived from a low molecular weight, weakly acidic organic acid and which volatilizes or decomposes and then volatilizes at a temperature up to 450° C., is added to the aqueous dispersion.

4,349,386

MINERAL POLYMERS AND METHODS OF MAKING THEM

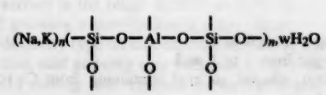
Joseph Davidovits, 16, rue Galilee, F-02100 Saint Quentin, France

Filed Aug. 29, 1980, Ser. No. 182,571
Claims priority, application France, Sep. 4, 1979, 79 22041
Int. Cl.³ C01B *33/26;* C04B *35/16*
U.S. Cl. 106—85 10 Claims

1. A polymer having a composition expressed in terms of oxides as follows:

$$1.0\pm0.2(yNa_2O,zK_2O):Al_2O_3:xSiO_2:wH_2O$$

where, in the fully hydrated form, w is in the range of up to about 7, x is in the range of about 3.5 to about 4.5, and y and z have values such that the sum of y and z equals 1, said polymer having the following formula



wherein n is the degree of polymerization, and said polymer having an x-ray powder diffraction pattern essentially that shown below:

Interplanar Spacing (in Angstroms)	Relative Intensity of the Lines
11.20	Broad and blurred
4.30	Middle strong
3.43	Strong
3.29	Strong
3.08	Middle strong
2.97	Middle strong
2.71	Weak
2.46	Weak
2.30	Middle strong
2.11	Weak
1.92	Very strong
1.81	Middle strong

4,349,387

METHOD FOR CALCINING FINE-GRAINED MATERIAL, PARTICULARLY FOR THE MANUFACTURE OF CEMENT CLINKER

Andris Abelitis, Rösrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,858
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014599
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—100 7 Claims

1. In a method for burning fine-grained material, particularly for the manufacture of cement clinker from cement raw meal containing a limestone component and a clay component in which a stream of said cement raw meal is sequentially treated in a preheating stage, a pre-calcining stage, a calcining stage and a sintering stage at progressively increasing temperatures, and thereafter in a cooling stage, the improvement which comprises:

introducing a deacidified raw meal fraction into a stream of air from said cooling stage at a temperature of at least about 350° C. to heat the fraction to a decarbonation temperature and then passing the fraction into said pre-calcining stage.

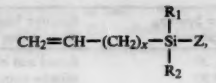
4,349,388

ASPHALT COMPOSITIONS MODIFIED WITH ORGANO SILANE COMPOUNDS

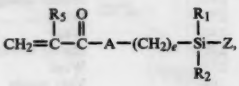
Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 133,170, Mar. 24, 1980, Pat. No. 4,292,371, which is a division of Ser. No. 66,207, Aug. 13, 1979, Pat. No. 4,243,426, which is a continuation-in-part of Ser. No. 852,772, Nov. 18, 1977, abandoned. This application Dec. 22, 1980, Ser. No. 218,901
The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.
Int. Cl.³ C08L *95/00*
U.S. Cl. 106—281 N 3 Claims

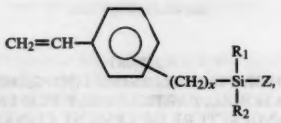
1. Glass fibers coated with a silicon-modified bitumen composition prepared by reaction of (1) a bitumen chemically modified with a modifying agent selected from the group consisting of, ammonia and an amine, said amine having the formula R_3-NH-R_4 or H_2N-$(CH_2)y$ $NH[(CH_2)_z$-$NH]_aH$ wherein R_3 is a C_1–C_{10} alkyl, R_4 is hydrogen or a C_1–C_{10} alkyl, y is an integer from 2 to 6, z is an integer from 2 to 6 and a is 0 or an integer from 1 to 6 and (2) an organo silicon compound selected from the group consisting of a compound having the formula:



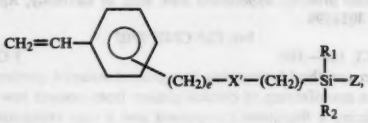
a compound having the formula:



a compound having the formula:



and a compound having the formula:



wherein x is 0 or an integer from 1–3, Z is a readily hydrolyzable group; R_1 and R_2 are selected from the group consisting of Z and a non-hydrolyzable organic group; R_5 is hydrogen or methyl; A is 0 or —NH—; e is an integer from 2–6, X′ is —NH— or —NH—$(CH_2)_e$—NH— and f is an integer from 2 to 6 and the hydrolysis products of said organo silicon compound, in the presence of a catalyst to promote the reaction between the ethylenic unsaturation of said organo silicon compound with ethylenic unsaturation in the bitumen.

4,349,389

DISPERSIBLE INORGANIC PIGMENT

John D. Schofield, Bury, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 29, 1980, Ser. No. 220,717

Claims priority, application United Kingdom, Jul. 26, 1979, 7926102; Feb. 14, 1980, 8005066

Int. Cl.³ C04B *31/44;* C09C *1/28*

U.S. Cl. 106—308 Q **7 Claims**

1. A dispersible pigment composition comprising a finely divided inorganic pigment the particles of which carry a first layer of a hydrophobing agent consisting of a hydrophobic chain containing from 12 to 250 carbon atoms attached to a hydrophilic group which anchors the hydrophobic chain to the pigment surface, and a second layer of a thermoplastic polymer or a mixture thereof with an emulsifying agent, having a softening point at or below 100° C., the second layer evenly covering and adhering to the hydrophobic first layer.

5. A process for preparing a dispersible inorganic pigment composition which comprises

(a) treating a slurry of a finely divided inorganic pigment in an inert liquid with a hydrophobing agent consisting of a hydrophobic chain containing from 12 to 250 carbon atoms attached to a hydrophilic group, capable of anchoring the hydrophobic chain to render the surface of the pigment hydrophobic followed by

(b) treating the hydrophobic pigment with a thermoplastic polymer, or a mixture thereof with an emulsifying agent having a softening point at or below 100° C., at the temperature of or above said softening point.

4,349,390

METHOD FOR THE ELECTROLYTICAL METAL COATING OF MAGNESIUM ARTICLES

Asbjorn L. Olsen, Porsgrunn, and Sigbjorn T. Halvorsen, Skien, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Nov. 19, 1980, Ser. No. 208,482

Claims priority, application Norway, Dec. 7, 1979, 793986

Int. Cl.³ C23C *3/00;* C23F *7/16;* C23C *3/02*

U.S. Cl. 148—6.15 R **8 Claims**

1. A method of chemically precipitating a zinc deposit onto an article of magnesium or a magnesium-base alloy, which comprises treating the article in a solution of oxalic acid; rinsing the thus treated article; treating the rinsed article in a bath comprising from 10 to 200 g/l of alkali metal pyrophosphate and, as the balance, mainly water, to provide an activated article; rinsing the activated article; and coating the rinsed, activated article with zinc.

4,349,391

PROCESS FOR PRESERVING PLANOGRAPHIC PRINTING FORMS

Loni Schell, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,541

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006094

Int. Cl.³ B41M *5/00*

U.S. Cl. 148—6.15 R **3 Claims**

1. A process for preserving a planographic printing form which is ready for printing and which is produced from a printing plate comprising mechanically, chemically or electrochemically roughened aluminum as a support material having a photosensitive layer or a photoconductive layer thereon, by treating said planographic printing form with an aqueous solution comprising (a) about 4 to 40 percent by weight of a water-soluble, film-forming, high-molecular weight organic compound selected from the group consisting of gum arabic, dextrin and polyvinyl alcohol and about 0.05 to 10 percent by weight of an organic phosphonic acid, as a hydrophilizing acid, and drying it.

4,349,392

TRIVALENT CHROMIUM PASSIVATE SOLUTION AND PROCESS

Robert J. Huvar, Ann Arbor, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed May 20, 1981, Ser. No. 265,487

Int. Cl.³ C23F *7/26*

U.S. Cl. 148—6.2 **42 Claims**

1. An aqueous acidic solution for treating receptive metal substrates to impart a chromate passivate film thereon comprising chromium ions substantially all of which are in the trivalent state, hydrogen ions to provide an acidic pH, a bath soluble and compatible organic carboxylic acid present in an amount effective to impart initial hardness and clarity to the passivate film of the structural formula:

$$(OH)_aR(COOH)_b$$

wherein:

a is an integer from 0 to 6;

b is an integer from 1 to 3; and

R is an alkyl, alkenyl, or aryl containing from C_1 to C_6 carbon atoms;

as well as the bath soluble and compatible salts thereof;

at least one additional metal ion selected from the group consisting of iron, cobalt, nickel, molybdenum, manganese, lanthanum, cerium, lanthanide mixture and mixtures thereof present

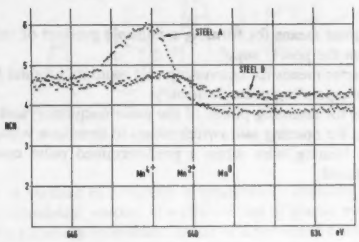
in an effective amount to impart increased corrosion resistance to the treated substrate.

4,349,393

CONTINUOUS HEAT TREATMENT FOR METAL SHEET

Philippe Paulus, and Marios Economopoulos, both of Liege, Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Sep. 16, 1980, Ser. No. 187,728
Claims priority, application Belgium, Sep. 21, 1979, 878944
Int. Cl.³ C21D *9/48*
U.S. Cl. 148—142 **11 Claims**



1. A method of continuous annealing of metal sheet contaminated with rolling oil, comprising the sequential steps of:

(a) heating the contaminated sheet at a temperature higher than the recrystallization temperature of the metal, at least the initial period of heating being in a naked flame furnace;

(b) rapidly cooling the heated sheet, the rapid cooling comprising contacting the sheet with an aqueous medium; and

(c) subjecting the cooled sheet to treatment in acid medium.

3. The method of claim 1, further comprising, after the rapid cooling step, subjecting the sheet to a carbon precipitation step at a temperature between 200° and 500° C.

4,349,394

METHOD OF MAKING A ZENER DIODE UTILIZING GAS-PHASE EPITAXIAL DEPOSITION

Lawrence S. Wei, Scottsdale, Ariz., assignor to Siemens Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 100,970, Dec. 6, 1979, abandoned. This application Nov. 13, 1980, Ser. No. 206,385
Int. Cl.³ H01L *21/205*
U.S. Cl. 148—175 **40 Claims**

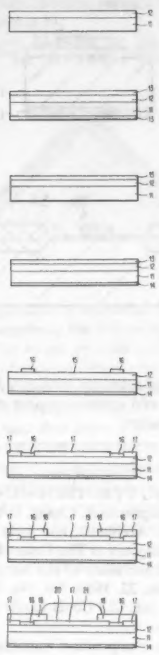
1. A method of making a Zener diode having a Zener voltage in a range of 2.4 to 3.3 volts, said method comprising the steps of:

(a) providing a silicon wafer of one conductivity type having an exposed surface, said wafer having a resistivity at its surface in the range of 0.003 to 0.006 Ω-cm; and

(b) growing a heavily-doped silicon layer of opposite conductivity type on said exposed surface by epitaxial deposition, said growing step comprising the steps of:

(1) etching said exposed surface at a first temperature above 1100° C. to clean said surface; and

(2) depositing heavily doped silicon on said exposed surface by epitaxial growth in a gas phase epitaxial reactor using silane (SiH_4) as a silicon source in the presence of a gaseous dopant, said epitaxial growth being effected at a second temperature in the range of 975°–1025° C. depending upon the Zener voltage desired, the heavily doped silicon layer so formed having a resistivity in the range of 0.001–0.003 Ω-cm.



4,349,395

METHOD FOR PRODUCING MOS SEMICONDUCTOR DEVICE

Nobuo Toyokura, Kawasaki; Hiroshi Tokunaga, Yokohama; Shinichi Inoue, Kawasaki; Hajime Ishikawa, Yokohama, and Masaichi Shinoda, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 23,460, Mar. 23, 1979, Pat. No. 4,270,136. This application Dec. 18, 1980, Ser. No. 217,689
Claims priority, application Japan, Mar. 25, 1978, 53-34529; Jun. 7, 1978, 53-68513
Int. Cl.³ H01L *21/225, 21/26*
U.S. Cl. 148—187 **9 Claims**

1. A method for producing a surface passivation layer on a metal-insulator-semiconductor device for trapping contaminant cations, said device comprising doped regions in a semiconductor substrate, said method comprising the steps of

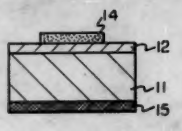
forming said insulating layer selectively on said semiconductor substrate to have a thickness in the range from 100 to 500 angstroms,

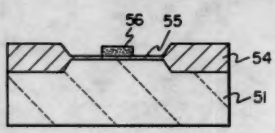
forming a metal layer on said insulating layer by a sputtering method to comprise at least one metal element selected from the group consisting of tungsten, molybdenum and titanium, and a cation-trapping element selected from the group consisting of boron, germanium, phosphorus and antimony, and

heating said substrate to diffuse some of said cation-trapping element out of said metal layer and effectively into the upper 60 angstroms of said insulating layer,

wherein said heating of said substrate is at a selected temper-

ature in the range from 700° to 1100° C. that yields an effective surface density of said contaminant cations that is up to two orders of magnitude less than that which results





from heating said substrate with said insulating and metal layers without said cation-trapping element at the same selected temperature.

4,349,396

METAL-CUTTING PYROTECHNIC COMPOSITION

Kurt F. Mueller; Marguerite S. Chang, both of Oxon Hill; Robert F. Farncomb, Accokeek, and Lyle O. Malotky, Oxon Hill, all of Md., assignors to The United Stated of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1980, Ser. No. 189,410

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.3 14 Claims

1. A pyrotechnic composition suitable for metal cutting which, based on total composition weight, comprises:

an oxidizer selected from the class consisting of calcium sulfate hemihydrate, anhydrous calcium sulfate, magnesium monohydrate, anhydrous magnesium sulfate, anhydrous strontium sulfate, and mixtures thereof in an amount from about 20 to 80 weight percent;

a metal fuel selected from the class consisting aluminum, magnesium, alloys of aluminum and magnesium, and mixtures thereof in an amount from about 15 to 70 weight percent;

a binder comprising a halopolymer in an amount from about 2 to 15 weight percent; and

a combustion promoter comprising sulfur in an amount from about 0 to 10 weight percent.

4,349,397

METHOD AND DEVICE FOR CONNECTING PIPE COMPONENTS MADE OF WELDABLE PLASTIC

Werner Sturm, Allerheiligenstr., 624, Hägendorf, Switzerland

PCT No. PCT/CH79/00055, § 371 Date Dec. 24, 1978, § 102(e) Date Nov. 28, 1979, PCT Pub. No. WO79/00973, PCT Pub. Date Nov. 29, 1979

PCT Filed Apr. 23, 1979, Ser. No. 177,746

Claims priority, application Switzerland, Apr. 24, 1978, 4406788/78

Int. Cl.³ B29C *27/02*

U.S. Cl. 156—64 11 Claims

1. A method for welding adjacent ends of piping comonents of weldable plastic by electrical resistance heating, comprising the steps of

supplying a welding voltage to resistance heating wire of a welding sleeve;

forming a multiple product of said welding voltage;

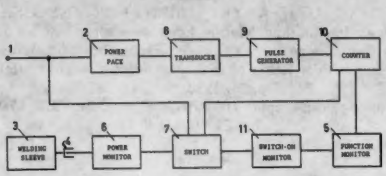
converting said multiple product into a corresponding pulse frequency;

counting pulses of said pulse frequency; and

terminating said welding voltage to said heating wire once a predetermined pulse count is reached.

6. A device for controlling welding cycles for welding adjacent ends of piping components of weldable plastic by electrical resistance heating, comprising

means for coupling a resistance heating wire of a welding sleeve to a power supply through a switching means;



multiplier means for forming a multiple product of voltage from the power supply;

converter means for converting said multiple product into a corresponding pulse frequency;

means for counting pulses of the pulse frequency; and

means for opening said switch means to terminate voltage to the heating wire when a predetermined pulse count is reached.

4,349,398

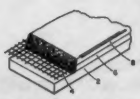
PROTECTIVE COATING SYSTEM

Richard F. Kearns, Broken Arrow; Thomas R. Kearns, and Timothy P. Kearns, both of Norman, all of Okla., assignors to Edward C. Kearns, St. Petersberg, Fla.

Filed Dec. 8, 1980, Ser. No. 214,122

Int. Cl.³ E04B *7/00*

U.S. Cl. 156—71 8 Claims



1. A method for applying an outer protective waterproof coating of latex cement to a continuous surface comprising first laying down a layer of screen over said surface, said screen having typically from about 5 to 15 holes per linear inch, next overlaying said screen with a readily flowable coating composition of said latex cement effective to cause said screen to float to the top of said coating, thereafter permitting said coating to form a set surface, thus bonding said screen and said set surface to said continuous surface, then applying a second layer of said coating material to said set surface and allowing said second layer to set whereby said layers are reinforced by means of said screen situated essentially between said layers, both of said layers in a set condition being from about 1/16 to about ¼ inch in thickness.

4,349,399

METHOD AND APPARATUS FOR SHRINKING A CONTAINER CLOSURE

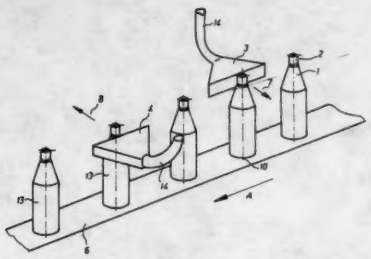
Albert Obrist, Kaiseraugst; Max Blaesi, Reinach, both of Switzerland, and Serge Auer, Riedisheim, France, assignors to Albert Obrist AG, Reinach, Switzerland

Filed Mar. 26, 1981, Ser. No. 247,778

Claims priority, application Switzerland, Mar. 28, 1980, 2452/80

Int. Cl.³ B29C *27/12;* B32B *31/26*

U.S. Cl. 156—86 10 Claims



1. A method of generally symmetrically shrinking a generally cylindrical portion of a closure cap of plastic material on to the generally cylindrical mouth of a container, characterised in that the mouth (1) of the container is first closed by the closure cap (2), and that the closure cap is then acted upon by means of hot jets of gas (5) from at least two nozzles (3, 4) alternately in such a way that the gas jets impinge on the closure cap in a temporally and/or spatially displaced mode and do not impinge on each other, wherein the direction of flow of at least two of the gas jets which occur in succession in respect of time or space is different so as to impinge on different portions of the same periphery of said closure cap.

4,349,400

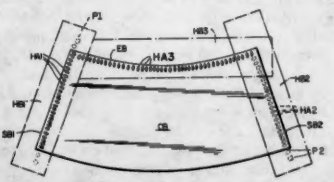
METHOD FOR MANUFACTURING TWO-PIECE CONTAINERS FROM FILLED THERMOPLASTIC SHEET MATERIAL

Morton Gilden, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 795,618, May 10, 1977, Pat. No. 4,299,349. This application Jan. 11, 1979, Ser. No. 2,606

Int. Cl.³ B29D *23/10*

U.S. Cl. 156—217 14 Claims



1. The method of forming a liquid tight and substantially undistorted seam in a thermoplastic sheet material including dispersed inorganic filler on the order of 30% to 50% by weight of the sheet material, comprising the steps of:

heating opposing faces of the opposed areas to be joined at a seam in substantially similar patterns of discrete heat softened and fusible areas, thereby creating interspersed areas softened to a lesser degree; and

clamping said opposed areas together over substantially the entire area of the seam.

4,349,401

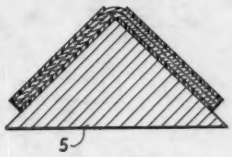
METHOD TO MANUFACTURE STRUCTURAL MEMBERS OF EPOXY PLASTIC

Anders Dahlberg, Täby, Sweden, assignor to Tatis Plasttäntningar AB, Täby, Sweden

Filed Jun. 23, 1980, Ser. No. 162,248

Int. Cl.³ B29C *27/00*

U.S. Cl. 156—221 5 Claims



1. A method of producing laminated structural members of plastic material comprising the following steps:

(a) saturating with an epoxy resin and corresponding hardner a first reinforcement fabric on a supporting surface and causing the same to harden in the form of a first thin, flexible fabric-reinforced layer;

(b) applying to said first layer a thicker layer comprising epoxy resin, a hardener and a thickening agent therefor to form a relatively thick intermediate layer;

(c) applying to said intermediate layer a fluid epoxy resin, a hardner therefor and a second reinforcement fabric; and

(d) before hardening of the layer applied in step c, placing the resulting laminate on a support and causing the same to harden to form a substantially rigid structural member.

4,349,402

METHOD FOR PRODUCING A BRIGHT METALIZED FOIL OR BOARD

Harry A. Parker, Murray Hill, N.J., assignor to Transfer Print Foils, Inc., East Brunswick, N.J.

Continuation-in-part of Ser. No. 119,782, Feb. 8, 1980, abandoned. This application Mar. 11, 1981, Ser. No. 242,424

Int. Cl.³ B44C *1/14*

U.S. Cl. 156—233 9 Claims

1. A method for preparing a metalized paper or board product having improved surface brightness consisting essentially of:

A. feeding a carrier film;

B. applying a lacquer coating to said carrier film capable of adherently bonding to a deposited metal layer and receiving display material;

C. vapor depositing a metal layer on said lacquer coating;

D. applying a polyurethane tie coating to said metal layer;

E. applying a wet adhesive emulsion coating having an acidic pH to the tie coating;

F. feeding the carrier of Step E and a base selected from paper and board, into the nip of a pair of pressure rollers, so that said adhesive emulsion coating remains wet as it contacts said base, and penetrates said base after said base and said carrier are brought together between said pressure rollers; and

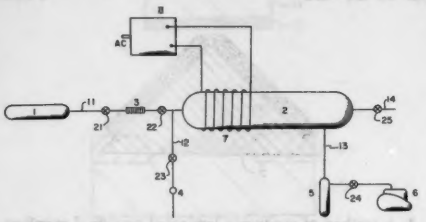
G. separating said carrier from said base.

4,349,403

METHOD FOR BONDING ELASTOMERS TO STEEL

Donald R. Blenner, and Herman V. Boenig, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Jan. 16, 1981, Ser. No. 225,488
Int. Cl.³ B05D 3/00, 3/04
U.S. Cl. 156—272.6 10 Claims



1. A method for improving environmental resistance of rubber-metal composite structures comprising:

(a) treating in a plasma of at least one non-reactive gas at least one nitrided metal element;

(b) applying to at least one plasma-treated surface of said nitrided metal element an adhesive composition suitable for bonding natural and synthetic rubbers to metal;

(c) contacting such adhesively-coated surface of such elements with a vulcanizable natural or synthetic rubber;

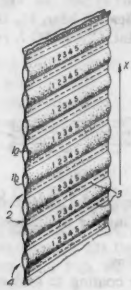
(d) subjecting the resultant assembly to conditions sufficient to vulcanize said rubber and cure said adhesive.

4,349,404

POLYMERIC ARTICLES

Pushpkumar D. Changani, Swindon; Donald G. Peacock, Kempsford, and David Roberts, Broome Manor Swindon, all of England, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 28, 1980, Ser. No. 172,889
Int. Cl.³ B29C 27/00, 17/04
U.S. Cl. 156—308.4 10 Claims



1. A process for the production of a marker sleeve assembly, the steps comprising:

deforming a substantially non-cross-linked web of polymeric material at a temperature below the crystalline melting point or softening point of the material to render the web heat-recoverable primarily in one direction;

fusing together parts of the web to one other substantially non-cross-linked polymeric web said fusing being done along lines substantially perpendicular to the direction of web heat recoverability to define a plurality of radially inwardly heat-recoverable marker sleeves disposed in side by side relationship; and

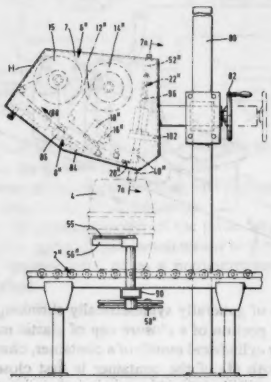
cross-linking the fused portions of the polymeric material.

4,349,405

AUTOMATIC LABELING APPARATUS

Winfried Dudzik, Im Haegleskies, 7441 Neckartailfingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 920,406, Jun. 29, 1978, abandoned. This application Sep. 3, 1980, Ser. No. 183,859
Int. Cl.³ B32B 31/00
U.S. Cl. 156—358 34 Claims



1. Apparatus for sequentially labeling container-shaped objects, such as beer barrels, similar to each other in shape but differing from each other in size and with each object having a labeling surface located in the same general location thereon and comprising:

(a) conveying means defining a path of movement for said objects along a generally planar horizontal surface;

(b) pneumatically operated arresting means movable into the path of movement of said objects along said horizontal surface for arresting each object in a predetermined support position in said path with the object being supported at a location on its exterior surface spaced from the labeling surface and with the labeling surfaces of the objects of a different size being at different distances from the support position;

(c) a pneumatically controlled axially elongated plunger located upwardly from the labeling surface in the predetermined position and having a face portion at one end thereof with said face portion extending transversely of the axial direction of said plunger and being directed toward an object arrested in said support position, said face portion being deformable under pneumatic pressure for transferring a label to the labelling surface;

(d) supply means for supplying a label to said face portion at a spaced distance from the labeling surface, said supply means including a pneumatically operated sensing mechanism for indicating the position of labels as they are moved toward said face portion of said plunger;

(e) pneumatically operated and controlled means for moving said plunger along a rectilinear path between a first position where said face portion is supplied with a label to a second position at a variable distance from the first position based on the size of said object being labeled where the label is applied to the labeling surface of said arrested object in the predetermined position and with the rectilinear path of said plunger being disposed at an acute angle substantially different from a right angle to the planar horizontal surface of the path of movement and to the labeling surface of said objects; and

(f) pneumatically operated reversing means responsive to a

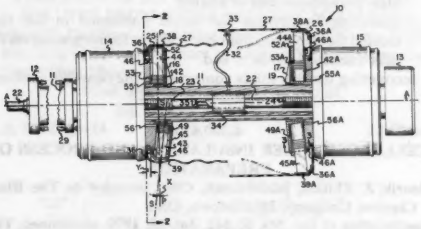
predetermined force exerted by said plunger on the labeling surface of said object being labeled for retracting said plunger from said object back to the first position.

4,349,406

TIRE BUILDING MACHINE DRUM

Joseph F. Stalter, Mogadore, Ohio, and Gilbert A. Felten, Kehlen, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 5, 1980, Ser. No. 204,322
Int. Cl.³ B29H *17/16*
U.S. Cl. 156—416 **14 Claims**



1. A contractible tire building drum rotatable about a drum axis and having a pair of shoulder rings connected by an inflatable bladder with each of said shoulder rings comprising a segmental generally cylindrical ring member having a radially inwardly extending flanged portion at one edge, said ring member having a primary set of primary segments, a secondary set of secondary segments, said primary segments being positioned circumferentially between said secondary segments, first means for retracting and extending said primary segments between an expanded generally cylindrical condition and a contracted nested condition of said ring member, second means for retracting and extending said secondary segments between said cylindrical condition and said nested condition of said ring member, and guide means for displacing said secondary segments in an axial direction during contraction of said ring member so that said secondary segments are axially offset from said primary segments in the contracted condition of said ring member and the flanged portions of said primary segments overlap the flanged portions of said secondary segments in said contracted nested condition of said ring member.

4,349,407

METHOD OF FORMING SINGLE CRYSTALS OF BETA SILICON CARBIDE USING LIQUID LITHIUM AS A SOLVENT

Lynn B. Lundberg, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 9, 1979, Ser. No. 37,247
Int. Cl.³ C30B *9/10*
U.S. Cl. 156—624 **4 Claims**

1. In a method of forming SiC single crystals by growth from solution, the improvement comprising using molten lithium as the solvent.

4,349,408

METHOD OF DEPOSITING A REFRACTORY METAL ON A SEMICONDUCTOR SUBSTRATE

Ming L. Tarng, Mercerville, N.J., and Walter A. Hicinbothem, Jr., Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1981, Ser. No. 248,038
Int. Cl.³ H01L *21/285, 21/308, 21/314, 21/32*
U.S. Cl. 156—628 **8 Claims**

1. A method of depositing a refractory metal on a silicon substrate, said method comprising:

depositing an oxygen doped polycrystalline silicon layer on one surface of said substrate;

depositing a phosphorus doped polycrystalline silicon layer on the outer surface of said oxygen doped polycrystalline silicon layer, said phosphorous doped polycrystalline silicon layer having a phosphorous concentration of at least about 10^{19} atoms/cm^3;

etching windows in said layers to expose said surface of said substrate in the areas where said refractory metal is to be deposited; and,

heating said substrate to a temperature in a range of between about 500° C. to about 800° C. and then exposing said substrate to a gaseous refractory metal hexafluoride wherein the refractory metal of said hexafluoride is selected from the group consisting of tungsten and molybdenum.

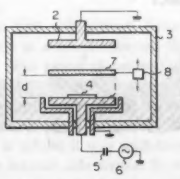
8. A method in accordance with claim **1** wherein a phosphosilicate glass layer is grown over said phosphorus doped polycrystalline silicon layer before said refractory metal is deposited, said refractory metal being deposited by a chemical vapor deposition technique whereby the refractory metal does not form on said phosphosilicate glass and wherein a corrosion resistant metal layer is deposited over said refractory metal and an adjacent portion of said phosphosilicate glass layer.

4,349,409

METHOD AND APPARATUS FOR PLASMA ETCHING

Hikou Shibayama; Tetsuya Ogawa, both of Machida; Makoto Kosugi, Yokohama; Tokushige Hisatsugu, Chofu, and Koichi Kobayashi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 11, 1981, Ser. No. 262,793
Claims priority, application Japan, May 12, 1980, 55-62427; May 13, 1980, 55-62992
Int. Cl.³ H01L *21/302;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 **18 Claims**



1. A method for effecting plasma etching of a semiconductor material comprising the steps of: providing a first and a second electrode and an electrically floating intermediate electrode, placing a semiconductor material on said first electrode and said electrically floated intermediate electrode, applying a high

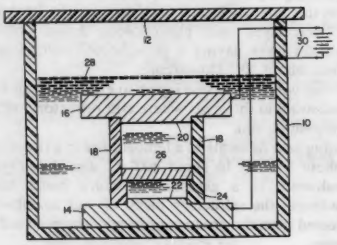
frequency power between said first and second electrode to produce a plasma between said first and second electrode, and etching the semiconductor material under the condition that the distance between said first and said intermediate electrode is changed during said etching.

4,349,410

METHOD OF MANUFACTURING A PYROELECTRIC VIDICON TARGET, APPARATUS FOR PRACTICING THE METHOD, AND A PYROELECTRIC TARGET MANUFACTURED BY THE METHOD

Edward H. Stupp, Spring Valley, and Joseph Lalak, Briarcliff Manor, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,714
Int. Cl.³ C23F *1/04*
U.S. Cl. 156—654 7 Claims



1. A method of manufacturing a target from a pyroelectric material exhibiting ferroelectric domains comprising the steps of:

providing a wafer of a pyroelectric material exhibiting a ferroelectrid domain structure; and

etching a central region of the wafer, thereby producing a thinned target with a thick support rim around an outer edge;

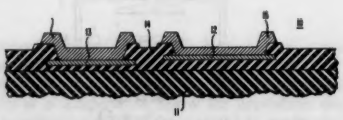
characterized in that the wafer is poled in a substantially uniform direction at least prior to etching.

4,349,411

ETCH PROCEDURE FOR ALUMINUM ALLOY

Yutaka Okinaka, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,270
Int. Cl.³ C23F *1/00, 1/02*
U.S. Cl. 156—659.1 17 Claims



1. A process for making a device comprising aluminum-copper alloy comprising the step of etching the aluminum-copper alloy with an etching solution characterized in that the etching solution has pH greater than 10 and comprises oxidizing agent for metallic copper, complexing agent for copper ions and surfactant.

4,349,412

METHOD OF CONCENTRATING AND DRYING WATER-CONTAINING FLUENT MEDIA

Karl Knotik, Eisenstadt; Peter Leichter, Vienna, and Johann Glock, Ebreichsdorf, all of Austria, assignors to Österreichische Studiengesellschaft fur Atomenergie Ges.m.b.H., Vienna, Austria

Continuation of Ser. No. 779,627, Mar. 21, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,624
Claims priority, application Austria, Mar. 26, 1976, 2237/76
Int. Cl.³ C23F *11/08*
U.S. Cl. 159—47 WL 10 Claims

1. A method of concentrating and drying, using a heat exchange surface, a waste water flowable medium concentrate containing borates which have a tendency to scale said heat exchange surface, comprising the steps:

adding an additive to the flowable medium containing said borates for the separation of solids contained therein;

said additive comprising a precipitate formed with at least one member selected from the group consisting of hydroxides, phosphates and arsenates;

evaporating to dryness the liquid contained in the thus treated flowable medium but without forming scale on the heat exchange surface; and

recovering the dry solids contained in the flowable medium.

4,349,413

CELLULOSIC FIBER INSULATION AND PROCESS OF PREPARATION

Henrik J. Eklund, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 60,242, Jul. 25, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 212,917
Int. Cl.³ D21B *1/16*
U.S. Cl. 162—23 9 Claims

1. A process of preparing a fire resistant, cellulosic thermal insulation suitable for blowing into place consisting essentially of the steps of:

(a) feeding cellulosic material selected from the group consisting of hard wood chips, soft wood chips, straw, bagasse, and mixtures thereof, into a pressurized chamber,

(b) pretreating said cellulosic material with steam under pressure and at an elevated temperature for a period of time sufficient to soften said cellulosic material and moisturize it by steam impregnation;

(c) passing the pretreated material to a fiberizing stage utilizing a refiner and injecting a fire retardant chemical selected from the group consisting of borax, boric acid, a borate, and mixtures thereof into said softened material at the eye of the refiner immediately before the grinding segments,

(d) fiberizing under pressure for a sufficient period of time to produce an insulation grade cellulosic pulp,

(e) discharging the fiberized material from the fiberizing stage and drying it.

4,349,414

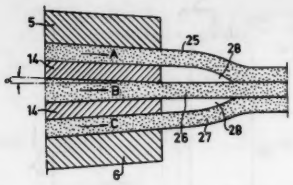
METHOD FOR FORMING A MULTILAYER JET OF PAPER MAKING STOCK

Erik G. Stenberg, Karlstad, Sweden, assignor to AB Karlstads Mekaniska Werkstad, Karlstad, Sweden

Continuation of Ser. No. 210,781, Nov. 26, 1980, abandoned, which is a continuation of Ser. No. 31,409, Apr. 19, 1979, abandoned. This application Sep. 23, 1981, Ser. No. 304,879
Claims priority, application Sweden, Apr. 25, 1978, 7804729
Int. Cl.³ D21F *11/00*
U.S. Cl. 162—123 12 Claims

1. In a method of forming a stratified jet of paper making stock for delivery to a forming zone, the steps of discharging towards the forming zone from a given location spaced therefrom at least two laterally coextensive, sheet-like jets of paper making stock in superimposed, spaced apart relation with a gap therebetween, and maintaining in the gap between said jets at

the discharge location a wedge-shaped body of gaseous fluid at a pressure such that the adjacent faces of the jets gradually



approach one another and meet to form a stratified jet at a distance from said discharge location not greater than the distance to said forming zone.

4,349,415

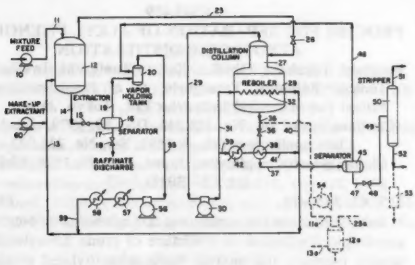
PROCESS FOR SEPARATING ORGANIC LIQUID SOLUTES FROM THEIR SOLVENT MIXTURES

Richard P. DeFilippi, Cambridge, and J. Edward Vivian, Arlington, both of Mass., assignors to Critical Fluid Systems, Inc., Cambridge, Mass.

Filed Sep. 28, 1979, Ser. No. 79,935

Int. Cl.³ B01D *3/34, 11/04*

U.S. Cl. 203—14 **32 Claims**



1. A process for separating an organic liquid from an organic liquid/solvent mixture, comprising the steps of

(a) contacting a mixture of an organic liquid solute and a solvent for said solute with an extractant fluid under conditions of temperature and pressure to render said extractant fluid a solvent for said organic liquid solute but substantially less for said solvent, thereby forming a fluid extract of said organic liquid solute in said extractant fluid and a raffinate comprising said solvent with minor amounts of said extractant fluid and organic liquid solute, said extractant fluid being a gas at ordinary ambient conditions of temperature and pressure;

(b) separating said fluid extract and said raffinate;

(c) providing said fluid extract as a still feed separable into two phases by distillation;

(d) distilling said still feed to produce a still overhead vapor and liquid still bottoms;

(e) compressing said still overhead vapor to provide compressed vapor at an elevated temperature;

(f) effecting indirect heat exchange between said compressed vapor and said still bottoms to provide the thermal energy required in said distilling step, and to form a liquid condensate of said vapor;

(g) recovering a liquid bottoms product comprising said liquid solute;

(h) recycling said liquid condensate as extractant fluid in said contacting step;

(i) flashing off said extractant fluid from said raffinate to provide a raffinate vapor flash;

(j) flashing off residual vapor from said still bottoms to form decompressed still bottoms; and

(k) separating liquid organic product from said decompressed still bottoms, thereby recovering said liquid bottoms product and producing a vapor flash.

4,349,416

PROCESS AND DEVICE FOR THE SEPARATION OF MIXTURES WHICH FORM AN AZEOTROPE

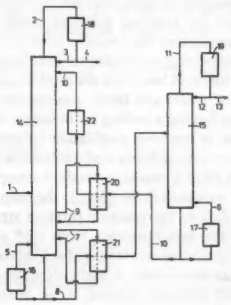
Hans-Walter Brandt, Odenthal, Fed. Rep. of Germany; Heinrich Steude, Pittsburgh, Pa.; Ludwig Bruns, and Hans-Dieter Köhler, both of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and EC Erdölchemie GmbH, Cologne-Worringen, both of, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,252

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038497

Int. Cl.³ B01D *3/40;* **C07C** *29/80*

U.S. Cl. 203—19 **14 Claims**



1. A process for the separation of components from a mixture which forms an azeotrope which comprises:

(A) subjecting said mixture to an extractive distillation in an extractive distillation column by adding an extracting agent to said column and distilling over one of said components to leave behind another component and said extracting agent;

(B) withdrawing said other component and said extracting agent as bottom, introducing the same into a regeneration column, distilling over said other component and withdrawing a bottoms comprising a major amount of said extracting agent;

(C) withdrawing a first side stream from said extractive distillation column at a point between the bottom of the column and the feed point of said mixture, passing the same in heat exchange with the bottoms from said distillation column and returning the so-heat exchanged first side stream to said extractive distillation column at a point below the point at which it was withdrawn; and

(D) withdrawing a second side stream from said extractive distillation column at a point between the bottom of the column and the feed point of said mixture, passing the same in heat exchange with the bottoms of said regeneration zone and returning the so-heat exchanged second side stream to said extractive distillation column at a point below the point at which it was withdrawn.

4,349,417

PROCESS FOR THE MANUFACTURE OF EXTREMELY PURE MONOETHYLENE GLYCOL

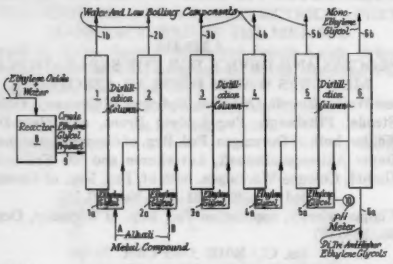
Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen; Josef Alfranseder, Hofschallern, and Iwo Schaffelhofer, Burghausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,590

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001727

Int. Cl.[3] B01D *3/34*; C07C *29/80, 31/20*

U.S. Cl. 203—33 8 Claims



1. In a process for the manufacture of extremely pure monoethylene glycol by reacting ethylene oxide and water in a reactor and transferring the reaction product stream to a distillation zone comprising a plurality of distillation columns interconnected by tubes, at least two distillation columns being used for distilling off water and those components of said reaction product stream having a boiling point below that of monoethylene glycol and at least one distillation column downstream of these first two columns being a glycol distillation column used to distill at its head a reaction product component consisting essentially of monoethylene glycol, the improvement which comprises: adding to the reaction product stream downstream from the reactor and upstream from said glycol distillation column a compound of an alkali metal selected from the group consisting of an alcoholate, a hydroxide, an oxide, a salt of a weak acid, and mixtures thereof, in an amount such that on entering the glycol distillation column the reaction product stream has a pH of 7 to 10.

4,349,418

PRODUCTION OF METHYLNAPHTHALENES AND TAR BASES INCLUDING INDOLE

Stephen E. Belsky, Parsippany, and Chempolil T. Mathew, Randolph, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 28, 1981, Ser. No. 287,668

Int. Cl.[3] G01D *3/14, 11/04*

U.S. Cl. 203—45 18 Claims

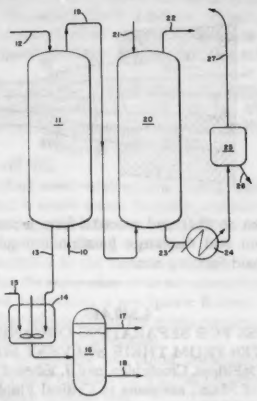
1. A process for the recovery of tar bases from a base-extracted tar distillation fraction which comprises the steps:

(a) extracting a base-extracted tar distillation fraction having a boiling point range not exceeding about 300° C.; containing methylphthalenes, indole and a member selected from the group consisting quinoline, isoquinoline and mixtures thereof with a buffered aqueous salt solution having a pH between about 0.5 and about 3.0 to produce an aqueous extract containing quinoline, isoquinoline or both and raffinate containing methylnaphthalenes and indole and substantially free of quinoline and isoquinoline,

(b) recovering indole from said raffinate, and

(c) recovering quinoline, isoquinoline or mixtures thereof from said aqueous extract.

15. A method of separating a mixture comprising methylnaphthalenes and indole which comprises extracting said mixture having a boiling point range not exceeding about 300° C.; with ethylene glycol and recovering a raffinate comprising



methylnaphthalenes and an extract comprising indole and ethylene glycol, and recovering indole from said extract.

4,349,419

PROCESS FOR SEPARATION OF ALKYL PHENOLS BY AZEOTROPIC DISTILLATION

Kazunori Takahata, Ohtake; Katsuo Taniguchi, Iwakuni, and Tadaaki Fujimoto, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 105,245, Dec. 19, 1979, abandoned. This application Feb. 3, 1981, Ser. No. 231,022

Claims priority, application Japan, Dec. 25, 1978, 53-158690

Int. Cl.[3] B01D *3/40*

U.S. Cl. 203—70 2 Claims

1. In a process for separating 2,6-xylenol and o-cresol by azeotropic distillation of a mixture of crude 2,6-xylenol containing o-cresol, the mixture being a methylated product of phenol or cresol, with a hydrocarbon azeotroping agent, the improvment comprising using as the hydrocarbon azeotroping agent one member of the group consisting of n-decane; dodecane isomers; 2,6-dimethyloctane; and 2,2,4,6,6-pentamethylheptane and removing the o-cresol as a top fraction, the 2,6-xylenol as a bottom fraction.

4,349,420

FRACTIONAL DISTILLATION PROCESS FOR THE PRODUCTION OF ALUMINUM CHLORIDE

Donald L. Stewart, Jr., Greensburg, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,280

Int. Cl.[3] B01D *3/14*

U.S. Cl. 203—75 11 Claims

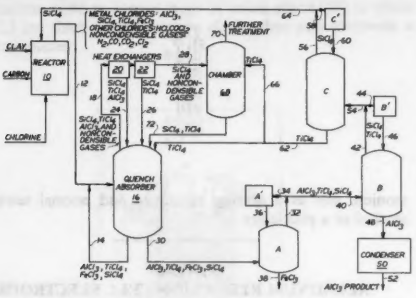
8. A process for the separation of $AlCl_3$ and $SiCl_4$ from a mixture containing $AlCl_3$, $FeCl_3$, $SiCl_4$, $TiCl_4$ and no substantial amounts of other metal chlorides by fractional distillation utilizing an array of distillation columns, said process comprising:

(a) introducing the mixture into a first distillation column operated at temperatures and pressures sufficient to separate from the mixture within the column $FeCL_3$ as a liquid and $ALCL_3$, $SiCL_4$ and $TiCL_4$ as gas, while avoiding the formation of a solid solution of $FeCl_3$ and $AlCl_3$ which would otherwise clog the column;

(b) introducing the remaining mixture from the first distillation column, containing $AlCl_3$, $SiCl_4$ and $TiCl_4$, into a second distillation column operated at temperatures and

pressures sufficient to separate liquid $AlCl_3$ from the mixture from the first distillation column; and

(c) introducing the remaining mixture from the second distillation column, containing $SiCl_4$ and $TiCl_4$, into a third distillation column operated at temperatures and pressures sufficient to separate $SiCl_4$ from the mixture from the second distillation column.



4,349,421

PREPARATION OF METAL PLATED POLYAMIDE THERMOPLASTIC ARTICLES HAVING MIRROR-LIKE METAL FINISH

Ghazi M. A. Khattab, Succasunna, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 75,855, Sep. 17, 1979, which is a continuation-in-part of Ser. No. 935,044, Aug. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,146, Nov. 7, 1977, abandoned. This application Dec. 3, 1980, Ser. No. 212,479

Int. Cl.³ C23C *3/02*

U.S. Cl. 204—38 B **10 Claims**

1. In a method for electroplating the surface of a shaped article, wherein the shaped article is comprised of a polyamide resin and about 5 to 60 wt. %, based on the total weight of the resin and filler, of a filler component which will not degrade the thermoplastic resin and which is susceptible to attack by dilute acid solutions, which is treated with a coupling agent, which method includes:

(a) treating the surface of the shaped article with a dilute acid solution of sufficient concentration, at a temperature of about 30° to 50° C. and for a sufficient length of time for said acid solution to attack and remove the filler at or near the surface of the article, but not attack the polyamide resin;

(b) sensitizing and activating the surface of the article obtained in step (a);

(c) depositing a layer of copper or nickel onto the surface of the shaped article by electroless deposition following step (b); and

(d) electrolytically plating the surface of said article with copper, nickel, chromium, or cimbination thereof, following step (c);

the improvement which comprises employing the filler in an average particle size below about 3.5 microns, wherein 95 numerical percent of the particles are less than about 10 microns in their longest dimension, thereby resulting in an electroplated shaped polyamide article having a mirror-like metal finish and possessing a metal-polymer peel strength of at least about 3 lbs. per linear inch.

4,349,422

ELECTROLYSIS PROCESS

Daniel E. Maloney, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 16, 1981, Ser. No. 225,639

Int. Cl.³ C25B *1/34, 13/02, 13/08*

U.S. Cl. 204—98 **10 Claims**

1. A method for improving the current efficiency in the process for electrolysis of an alkali metal chloride in an electrolytic cell divided by a cation-exchange membrane into an anode compartment and a cathode compartment in which an alkali metal hydroxide is produced, said membrane comprising at least a first layer, said first layer being of a first fluorinated polymer having carboxylic functional groups in ion-exchange form and having an equivalent weight in the range of 1000 to 1100, said first layer having a first exposed surface which has a roughness in the range of 0.4 to 1.3 microns, said membrane having a second exposed surface which has a roughness in the range of 1.3 to 13 microns, provided that said first exposed surface is smoother than said second exposed surface, wherein said membrane is disposed so that said first exposed surface faces toward said cathode compartment.

4,349,423

PROCESS FOR DECOMPOSING HARD METAL SCRAP

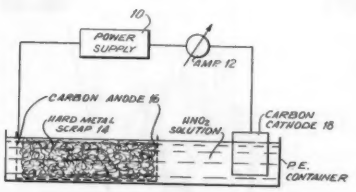
Hans G. Nützel, Bilthoven, and Rudolf Kühl, Vianen, both of Netherlands, assignors to SKF Industrial Trading & Development Co. B.V., Nieuwegein, Netherlands

Filed May 14, 1979, Ser. No. 38,936

Claims priority, application Netherlands, May 25, 1978, 7805669

Int. Cl.³ C25F *5/00*; C01G *41/00*

U.S. Cl. 204—146 **12 Claims**



1. A process for the decomposition of hard metal scrap containing tungsten carbides and binding metal which includes cobalt, comprising the steps of electrolyzing a dilute nitric acid solution initially containing 5 to 15 percent of HNO_3 by weight with the scrap serving as the anode, and using an inert cathode, using an anodic current density of 2 to 10 amperes per Kg of scrap, removing tungsten compounds from the undissolved part of the scrap after the electrolysis and separating said cobalt from the resulting solution.

4,349,424

ION SPUTTER TEXTURED GRAPHITE

James S. Sovey, Strongsville; Ralph Forman, Rocky River; Arthur N. Curren, North Ridgeville, and Edwin G. Wintucky, Lakewood, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

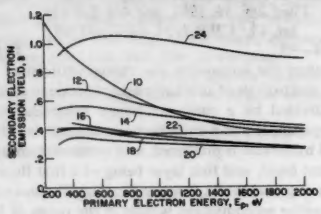
Filed May 15, 1981, Ser. No. 264,378

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 E **5 Claims**

1. A method of treating the surface of a pyrolytic graphite electrode plate for use in a multistage depressed collector to attain low secondary emission yields and reduced numbers of reflected primary electrons from the collector comprising the steps of

placing said plate in a vacuum environment of about 4×10^{-5} torr, and



exposing at least one surface of said plate to ions having an energy between about 500 eV and 1000 eV and an ion beam current density between about 1.0 mA/cm^2 and 6.0 mA/cm^2 for about 4 to 6 hours.

4,349,425

TRANSPARENT CONDUCTIVE FILMS AND METHODS OF PRODUCING SAME

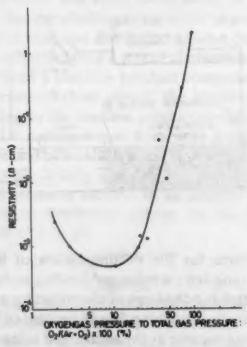
Kiyoshi Miyake, 2658, Oki-ube, Ube-shi, Yamaguchi, and Naoyuki Miyata, Ube, both of Japan, assignors to Hitachi, Ltd. and Kiyoshi Miyake, both of Tokyo, Japan

Filed Aug. 23, 1978, Ser. No. 936,124

Claims priority, application Japan, Sep. 9, 1977, 52/107984; Jul. 7, 1978, 53/81881

Int. Cl.^{3} C23C *15/00*

U.S. Cl. 204—192 P **11 Claims**



1. A method of producing thin films by sputtering comprising using an alloy consisting essentially of cadmium and tin as a target, and causing an electrical discharge to take place under the application of a d-c electric field in a gas mixture consisting essentially of an inert gas for sputtering metal atoms from the target and oxygen gas for oxidizing the sputtered metal atoms thereby forming a film of oxides of cadmium and tin.

4,349,426

ANION SENSING ELECTRODE

Kenshi Sugahara, Katsuta, and Junji Mori, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,458

Claims priority, application Japan, Oct. 26, 1979, 54-139026

Int. Cl.^{3} G01N *27/46*

U.S. Cl. 204—195 M **11 Claims**

1. An anion sensing electrode which comprises a vessel means containing an inner filling solution; an internal electrode in contact with the inner filling solution; a sensing membrane fixed to the vessel means, said sensing membrane containing a polymeric substance as a support substance, a quaternary ammonium salt as a sensing substance and normal tetradecyl alcohol as a plasticizer.

4,349,427

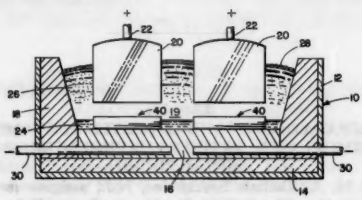
ALUMINUM REDUCTION CELL ELECTRODE

Warren H. Goodnow, Palo Alto, and John R. Payne, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jun. 23, 1980, Ser. No. 161,703

Int. Cl.^{3} C25C *3/08*; C25B *11/12*

U.S. Cl. 204—243 R **7 Claims**



1. In an electrolytic cell for the reduction of alumina having a cavity lined with refractory material and adapted to contain a molten aluminum body and a body of molten electrolyte containing dissolved alumina, at least one prebake anode depending into said cavity and a cathode of a refractory hard metal at the bottom of said cavity beneath said anode, said anode and cathode being in electric circuit relationship, the improvement comprising a replaceable modular cathode assembly having an electrically conducting surface comprised of a plurality of refractory hard metal members, which surface is positioned beneath the anode and within the projection of the bottom surface of the anode, said assembly having a structure that is free standing and resting upon the bottom of the cavity and adapted to extend into said electrolyte and wherein the refractory hard metal members are free from externally applied forces or rigid constraints.

4,349,428

CARBON CLOTH SUPPORTED ELECTRODE

Wen-Tong P. Lu, Upper St. Clair, and Robert L. Ammon, Baldwin both of Pa., assignors to The United States of America as represented by the U.S. Dept. of Energy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,135

Int. Cl.^{3} C25B *11/08, 11/12*

U.S. Cl. 204—294 **15 Claims**

1. A method of making an electrode comprising:

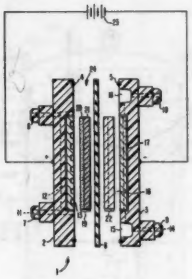
(A) preparing a liquid suspension of about 8 to about 18% by weight solids, said solids comprising

(1) about 0.5 to about 1.5% by weight of supported catalyst particles selected from the group consisting of platinum, palladium, palladium oxide, and mixtures thereof;

(2) about 6.5 to about 14% carbon powder (support) having a particle size of less than about 20 mμm, and

(3) about 1 to about 2.5% by weight of an inert binder having a particle size less than about 550 mμm;

(B) pouring a sufficient amount of said suspension over a carbon cloth to form a layer of solids about 0.02 to about 0.1 cm thick on said carbon cloth when said electrode is completed;



(C) applying a vacuum to the opposite side of said carbon cloth to remove said liquid;

(D) drying said carbon cloth to form said layer of solids;

(E) compressing said carbon cloth and layer of solids at about 10 to about 50 MPa; and

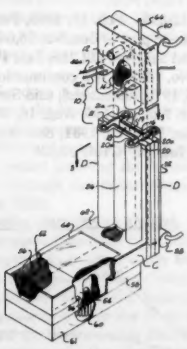
(F) sintering said binder in an inert atmosphere.

4,349,429

ELECTROPHORESIS DEVICE

Percy H. Rhodes, and Robert S. Snyder, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 16, 1981, Ser. No. 254,575
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—299 R **17 Claims**



1. An electrophoresis device for separating colloidal and macromolecular cellular particles comprising:

a distribution chamber being an inlet for the introduction of an electrolytic buffer solution;

sample insertion means for inserting a narrow sample stream containing said particles into said buffer solution;

a separation chamber in fluid communication with said distribution chamber in which said particles are separated into fraction streams of different cellular species;

enclosure wall means defining said separation chamber having high thermal conductivity to reduce horizontal thermal gradients and control the axial thermal gradient in said separation chamber by external cooling;

cooling means carried adjacent said enclosure wall means for conveying a flow of coolant in an axial direction relative to said separation chamber;

a plurality of spaced electrode assemblies carried adjacent said separation chamber, each of which includes an electrode chamber having a dialysis membrane through which the electrolytic current flows to impress an electrical field across said separation chamber;

passage means through which said current flows into said separation chamber;

a collection chamber in fluid communication with said separation chamber in which said stream of particles are fractionated and collected, and

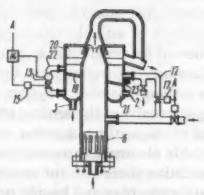
outlet means in fluid communication with said collection chamber through which said fractonated matter flows.

4,349,430

APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

Vyacheslav T. Efimov, ulitsa Sumskaya, 59, kv. 2; Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91 "A", kv. 20; Arkady R. Matsev, ulitsa Timurovtsev, 19, kv. 130; Ljudmila F. Shamsha, ulitsa Dinamovskaya, 3, kv. 23., and Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25, all of Kharkov, U.S.S.R.

Filed Jun. 25, 1980, Ser. No. 162,748
Int. Cl.³ C02F *1/46*
U.S. Cl. 204—302 **2 Claims**



1. Apparatus for continuous electrochemical purification of contaminated liquids comprising, an electrocoagulation chamber for containing an electrolyte and having soluble electrodes therein, means to introduce said electrolyte into said electrocoagulation chamber, means to introduce contamination liquid into said electrocoagulation chamber while it contains said electrolyte, said electrocoagulation chamber being open at the top, a settling chamber disposed circumferentially about said electrocoagulation chamber for receiving liquid from the electrocoagulation chamber after treatment of the contaminated liquid to coagulate impurities therein, a discharge conduit above the level of the bottom of the settling chamber to discharge purified liquid from the settling chamber, a liquid purification degree analyzer, actuating means under control of said analyzer to interrupt the discharge of the purified liquid and introduction of contaminated liquid when the degree of purification of the purified liquid discharged from the settling tank is below a given level, means under control of said analyzer to recirculate the purified liquid from the settling chamber to said means to introduce the contaminated liquid into said electrocoagulation chamber for repurification when said purification is below said given level, a partition in said settling chamber dividing it into a top space and a bottom space, a conduit connecting said top space and said bottom space, and said liquid purification degree analyzer being disposed to analyze liquid in said conduit.

4,349,431

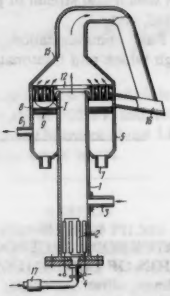
APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25; Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vladimir A. Kolyada, Petrozavodskaya ulitsa, 91-a, kv. 30, and Arkady R. Mataev, ulitsa Timurovtsev, 19, kv. 130, all of Kharkov, U.S.S.R.

Filed Sep. 5, 1980, Ser. No. 184,424

Int. Cl.³ C02F *1/46*

U.S. Cl. 204—302 **7 Claims**



1. An apparatus for electrochemical purification of contaminated liquid comprising: an electrocoagulation chamber having an inlet pipe for feeding contaminated liquid into the chamber and another inlet pipe for feeding electrolyte into the chamber, a system of energizable soluble electrodes within a lower portion of the electrocoagulation chamber, said electrocoagulation chamber having an upper end opening through which the contaminated liquid is discharged, a settling chamber circumferentially of said electrocoagulation chamber and said opening thereof for receiving the liquid from the electrocoagulation chamber, an outlet pipe for removing purified liquid from the settling chamber, a system of energizable insoluble electrodes internally of the settling chamber, a distributor at an upper end of the settling chamber above the level of the system of insoluble electrodes circumferentially of said opening in communication therewith for receiving liquid from the electrocoagulation chamber and having orifices evenly distributed about said opening for uniformly distributing of the liquid from the electrocoagulation chamber into the settling chamber and conduits to allow foam to pass therethrough.

4,349,432

PYROLYSIS OF HYDROCARBONS

Frederick Rowe, Middlesbrough, and David Brown, Northallerton, both of England, assignors to Imperial Chemical Industries Limited, London, England

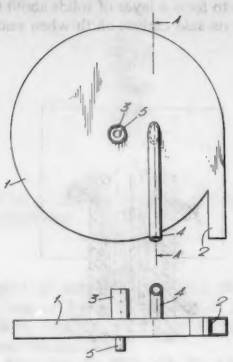
Filed Oct. 14, 1980, Ser. No. 196,562

Claims priority, application United Kingdom, Oct. 18, 1979, 7936152

Int. Cl.³ C10G *9/36, 9/38*

U.S. Cl. 208—130 **7 Claims**

1. A process for the pyrolysis of a hydrocarbon feedstock which comprises introducing the feedstock into a reactor and therein flowing the feedstock countercurrently to a stream of hot hydrogenating gas, the hydrogenating gas being obtained,



at least in part, by partial combustion of carbonaceous by-products from the pyrolysis process.

4,349,433

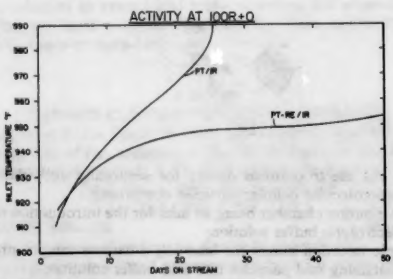
SEPARATELY SUPPORTED POLYMETALLIC REFORMING CATALYST

Hans J. Schoennagel, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 120,956, Feb. 13, 1980, Pat. No. 4,288,348, which is a continuation-in-part of Ser. No. 76,047, Sep. 17, 1979, Pat. No. 4,264,475, and Ser. No. 112,756, Jan. 17, 1980, Pat. No. 4,263,134, said Ser. No. 76,047, is a continuation-in-part of Ser. No. 934,143, Aug. 16, 1978, abandoned, said Ser. No. 112,756, is a continuation of Ser. No. 934,143, Aug. 16, 1978, abandoned. This application Mar. 25, 1981, Ser. No. 247,483

Int. Cl.³ C10G *35/06*

U.S. Cl. 208—139 **11 Claims**

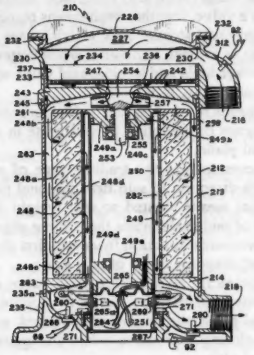


1. A reforming process which comprises contacting a reforming charge stock under reforming conditions with a catalyst composition made up of a mixture of two components, one component comprising a minor proportion of platinum and rhenium on a support and the second component comprising a minor proportion of iridium on a separate support.

4,349,434
FILTRATION SYSTEM FOR SPAS, HOT TUBS, SWIMMING POOLS AND THE LIKE

William R. Jaworski, 26075 Birch Bluff Rd., Excelsior, Minn. 55331

Continuation-in-part of Ser. No. 110,332, Jan. 7, 1980, abandoned. This application May 4, 1981, Ser. No. 259,710
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—94 13 Claims

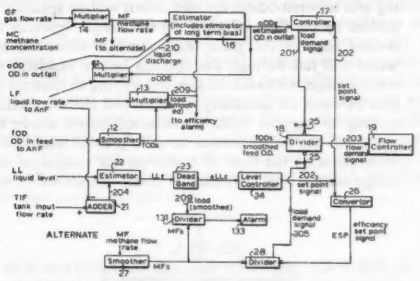


1. A water heater and filtering apparatus for a hot tub, spa, pool, or the like comprising
(a) a housing having a chamber therein,
(b) a filter element removably mounted in the chamber, the filter element having relatively small water flow openings therethrough,
(c) means to open said housing to provide access to the inside of the chamber for removing the filter,
(d) a basket-shaped strainer removably mounted within the housing and having a bottom wall upon which debris collects during operation for later removal and an upwardly extending side wall at the periphery of the bottom wall, the strainer being characterized by having relatively large visible openings therein and being adapted to remove relatively large debris before it can reach the filter element,
(e) a water inlet duct in the housing communicating through the housing to the inside thereof and including means for passing the incoming water into the space above the strainer between the strainer and a portion of the housing so that the water entering the housing through the inlet flows first through the basket-shaped strainer and then through the filter,
(f) a water outlet duct in the housing communicating with the opposite side of the filter from the side communicating with the strainer to exhaust water from the housing and,
(g) a first heating means comprising an electric heating element mounted within the housing and connected in fluid communication with the filter and strainer between the filter and the water outlet duct for heating the water passing therethrough, the filter thereby removing particles from the water before it reaches the heater to thereby prevent damage to the heater from suspended solids,
(h) pump means within the housing including an electric pump motor comprising a second heating means and pump impeller connected thereto to force water first through the strainer next through the filter, and then over the heater, waste heat from said second heating means supplementing that from the said first heating means to provide an overall thermal efficiency approximateing 100%,
(i) the apparatus is adapted to be connected in a water circuit with the tub, spa, or pool to heat and filter the water therein and
(j) temperature sensor means in heat conductive relationship with water in said water circuit and being wired to the heating element to divide heating between the first and second heating means to thereby maintain a selected temperature.

4,349,435
CONTROL OF ANAEROBIC FILTER

Shinya Ochiai, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,813
Int. Cl.³ C02C *1/02*
U.S. Cl. 210—96.1 10 Claims



1. In a control circuit for a system:
(1) an estimating filter means that
(a) receives input signals from sensors,
(b) generates from said received signals, from an integrator in said estimating filter, an estimate of the present value of a variable of the system,
(c) compares that estimate with a signal from the sensor of that variable and
(d) generates from said comparison a difference error signal that is combined with said received signals and fed back to said integrator, and
(2) means for eliminating long term bias that may be present in at least one of said received signals, said eliminating means comprising a high pass filter means through which said received input signals are transmitted to said integrator, said high pass filter means rejecting bias which persists for a period substantially longer than the time constant of the system.

4,349,436
GRATE AND WATER RECOVERY SYSTEM

Roland F. Kaump, 1714 W. 23rd St., Loveland, Colo. 80537

Filed Nov. 12, 1980, Ser. No. 206,111
Int. Cl.³ B01D *39/20*
U.S. Cl. 210—104 12 Claims

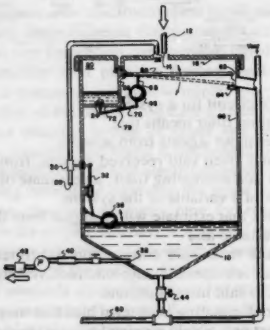
1. A grate for use as a self-cleaning filter, comprising
a grate assembly adaptable for mounting in an installed position along a diagonal plane to a horizontal axis with said grate formed with a leading edge opposed to a trailing edge, such that in the installed position the trailing edge is vertically lower than the leading edge, said grate assembly formed with a plurality of spaced upraised rib sections

that each extend in the direction from the said leading edge of the said trailing edge, with at least

one flange section located between a pair of said rib sections, the upper surface of which flange section extends in the said diagonal plane, with said rib sections extending above the said flange section and with said flange section forming an upper exposed surface of said grate assembly, and with at least

one opening located between a pair of said rib sections and extending in the direction from the trailing edge to the leading edge, such that

the flow of a liquid freely falling upon an upper section of the grate will be distributed between some flow of liquid on said flange or flanges flowing towards the trailing edge and some flow of liquid through said opening, and such that debris in the liquid that falls on the said flange or flanges, where said debris is of a larger size than the opening will accommodate, the said debris will be splashed or pushed by the flow of water on the flanges towards the trailing edge of the grate while most or all of the said water will fall through the opening before reaching the trailing edge, with said rib sections serving to channel the flow of water on said flange sections and said rib sections serving to support wide portions of debris above the surface of the flange section so as to prevent such debris from blocking the flow of water on the surface of said flange sections, with the flow of water channelled by said



rib sections serving to wash debris resting on the flange surface of the trailing edge of the grate.

10. A grate for use as a self-cleaning filter, comprising

a grate assembly adaptable for mounting in an installed position along a diagonal plane to a horizontal axis with said grate formed with a leading edge opposed to a trailing edge, such that in the installed position the trailing edge is vertically lower than the leading edge, such grate assembly formed with a plurality of spaced upraised rib sections that each extend in the direction from the said leading edge to the said trailing edge, with at least

one flange section located between a pair of said rib sections, the upper surface of which flange section extends in the said diagonal plane, and with at least

one opening located between a pair of said rib sections and extending in the direction from the trailing edge to the leading edge, such that

the flow of a liquid freely falling upon an upper section of the grate will be distributed between some flow of liquid on said flange or flanges flowing towards the trailing edge and some flow of liquid through said opening, and such that where debris in the liquid that falls on the said flange or flanges, and where said debris is of a larger size than the opening will accomodate, the said debris will be splashed or pushed by the flow of water on the flanges towards the trailing edge of the grate while most or all of the said water will fall through the opening before reaching the trailing edge,

together with first receiver means located to receive liquid that is filtered through the opening of said grate, where said first receiver means is located below the grate opening, in which

the said first receiver means is a storage tank for recovery and reuse of drain water, together with

a receptacle for containment of chemicals useful in treatment of drain water, with said receptacle linked to the storage tank by a valve, together with means responsive to flow of water into said storage tank which means is linked to said valve so as to open said valve when water is flowing into said storage tank, and to close said valve upon cessation of such water flow, in which

the said means to control said valve comprises

pivotal means of mounting of said grate in a first generally diagonal plane,

spring means to bias the trailing edge of said grate in an upwards direction to said first diagonal plane,

said pivotal means located so that weight of water on the flanges of said grate biases the trailing edge of the grate in the downwards direction from said first diagonal plane, to a second diagonal plane of said grate,

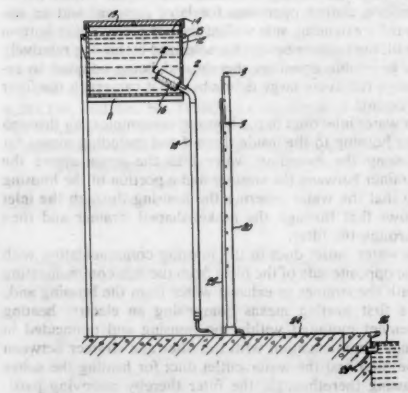
linkage means for said grate to said valve such that when said grate is pivoted by the flow of water to the second diagonal plane, the said valve is opened, with said linkage means closing said valve when the grate is in the first diagonal plane.

4,349,437

AUTOMATIC AND CONTINUOUS CHEMICAL FEED SYSTEM

David A. Rickett, 15600 Del Prado Dr., Hacienda Heights, Calif. 91745

Filed Jul. 24, 1980, Ser. No. 171,983
Int. Cl.[3] B01D *33/38*
U.S. Cl. 210—169 12 Claims



1. An automatic and continuous chemical feed system for the introduction of a chemical solution into a liquid body comprising:

a vessel vented to maintain atmospheric pressure for containing the chemical solution to be introduced into the liquid body, said vessel being fixably positioned above the ground and having an opening near the base thereof;

a means for filtering said chemical solution as the solution flows out of the vessel;

a downcomer means connected to said filter means and extending towards the ground, said downcomer means having an inner diameter sufficiently large to spontaneously vent any gases which are formed in the chemical

solution back through said filter means and into said vessel;

an adjustable standpipe means to regulate changes in the flow of the chemical solution;

a tubular connecting means to connect said downcomer means and said standpipe means, thereby enabling the chemical solution to flow therebetween, said tubular connecting means determining the initial flow rate of the chemical solution;

a tubular conveyance means attached to said standpipe means to convey the chemical solution to a selected location in or above the liquid body.

10. An automatic and continuous chemical feed system for the introduction of a chemical solution into a swimming pool comprising:

a vessel for containing the chemical solution to be introduced into the swimming pool, said vessel being fixably positioned above the ground and having an opening near the base thereof;

a filter cartridge means for filtering said chemical solution as the solution flows out of the vessel, said filter cartridge means being positioned at an angle of about 30° from the horizontal to aid in venting gases formed in the chemical solution back through the vessel;

a downcomer means which is connected to said filter cartridge means and which extends towards the ground, said downcomer means having an inner diameter sufficiently greater than ¼" such that gases formed in the chemical solution spontaneously vent back through said filter cartridge means and into said vessel;

an adjustable standpipe means having a series of holes drilled vertically therein at an angle of about 10° from the horizontal to permit changes in the rate of flow of the chemical solution to be regulated;

a tubular connecting means to connect said downcomer means and said standpipe means, the end of the tubular connecting means which is connected to the standpipe means being positioned in one of the holes drilled therein, said tubular connecting means determining the initial flow rate of the chemical solution;

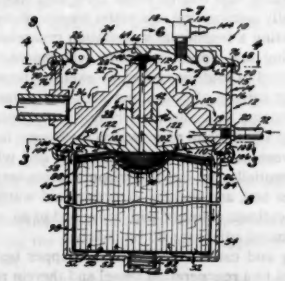
a tubular conveyance means attached to said standpipe means to convey the chemical solution to a selected location in the swimming pool.

4,349,438

OIL REFINER

Loyie Sims, Santa Ana, Calif., assignor to Sims Oil, Inc., Newport Beach, Calif.

Filed Jul. 8, 1981, Ser. No. 281,338
Int. Cl.³ B01D *35/18, 3/28*
U.S. Cl. 210—180 **18 Claims**



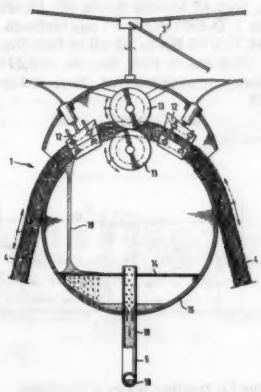
14. A device for removing solid and vaporizable contaminants from engine oil comprising: a casing having a removable concave lower portion having an upwardly opening mouth with radially outwardly directed flange means thereon, a stationary upper portion including a cylindrical collar with an oil inlet thereto and an oil outlet therefrom and fastening means defined on its upper and lower extremities, a lid having a vapor vent thereon and an electric heating element therein with fasteners defined at the periphery thereof for direct fluid-tight engagement with said fastening means defined at the upper extremity of said cylindrical collar, a vaporization plate extending across the entire breadth of the interior of said cylindrical collar to form a barrier to isolate said oil inlet and said oil outlet from each other on opposite sides of said barrier, and said vaporization plate has a raised center with a plurality of descending tiers defined in concentric fashion about said center, a baseplate located beneath said vaporization plate and cooperatively arranged with said vaporization plate to define an upright duct leading to said center of said vaporization plate, at least one outlet in said baseplate to define at least one oil passageway to said lower removable protion of said casing from said oil inlet, a retaining ring encircling said removable lower portion of said casing and engageable with said fastening means at the lower extremity of said cylindrical collar to entrap said flange means of said lower casing portion and to releasably seal said upper and lower casing portions together, a disposable filter cartridge containing porous filtering material therein, located within said lower portion of said casing and means for maintaining said disposable filter cartridge in sealed communication with the lower extremity of said upright duct and in open communication with said oil inlet to said casing to direct the flow of oil from said casing inlet through said filter cartridge to said upright duct.

4,349,439

APPARATUS FOR COLLECTING OIL OR SIMILAR SUBSTANCES FROM THE SURFACE OF WATER

Lars I. Lundin, Kauppiaankatu 4, SF-06150, Porvoo 15, Finland

Filed Apr. 27, 1981, Ser. No. 257,871
Int. Cl.³ E02B *15/04*
U.S. Cl. 210—242.3 **9 Claims**



1. An apparatus for collecting oil and similar substances from the surface of water, the apparatus comprising an elongated member in the form of a rope having a specific weight less than that of water and being adopted to collect the substance to be collected:

a pair of booms engaging the rope at two positions apart from each other so as to hold the rope in a loop on the water surface;

a cleaning device for removing substance collected by the rope;

means for pulling the rope through the cleaning device; and

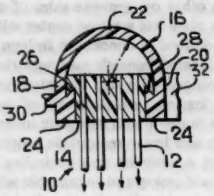
rotation means connected to at least one given end of the rope for rotating the rope about its longitudinal axis.

4,349,440

CAPILLARY TUBE EXCHANGE DEVICE

William G. Esmond, 800 Country Club Rd., Havre de Grace, Md. 21078

Filed Nov. 21, 1977, Ser. No. 853,504
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—321.1 10 Claims



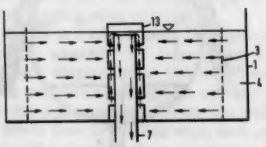
1. In an exchange device, a group of tubes arranged generally in spaced parallel relation in at least one row, sealing means bonding opposite end portions of said tubes together with external surfaces of said tube end portions being sealed relative to each other, said sealing means at each end of said tubes being in the form of an elongated rib with ends of said tubes opening through said ribs, and a tubular header sealed to each of said ribs and in combination with an associated rib defining a fluid passage in communication with interiors of said tubes, said headers each being generally U-shaped in cross-section and having spaced legs each sealed with a side surface of a respective rib, and said legs having thickened free end portions terminating centrally of said rib sides in tapered shoulders having a direct mechanical interlock with said rib sides.

4,349,441

FLUID TREATMENT METHOD AND APPARATUS

Hans-Georg Moll, Görzallee 49a; Andreas Grohmann, Drakestrasse 52a, both of D-1000 Berlin 45; Ulrich Hässelbarth, Adolfstrasse 3, D-1000 Berlin 37, and Helmuth Marks, Maulbeerallee 54, D-1000 Berlin 20, all of Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,521
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927802
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—512.1 6 Claims



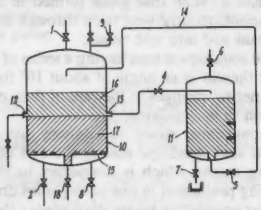
1. Apparatus for treating water comprising:
a cylindrical container having a central axis and adapted to contain a fluid;
baffle means spaced radially inward from the cylindrical container wall and defining an annular volume between the baffle means and cylindrical container wall;
means for introducing a fluid into the annular volume defined in the cylindrical container and tangential thereto;
a conduit communicating through the bottom of the cylindrical container and extending axially upward from the bottom of the container; and
a pipe coaxially positioned around and spaced from the conduit to define an annulus therebetween, the pipe having a plurality of axially spaced, circumferentially defined slots defined therein;
whereby fluid introduced at the wall of the cylindrical container will flow with a substantial radial component inward through the pipe slots with minimal flow in the axial direction of the container to facilitate settling of sediment in fluid and permit flow of clear fluid through the slots and out through the conduit.

4,349,442

METHOD AND APPARATUS FOR TREATING WATER BY ION EXCHANGE

Christian Barraque, Sannois, France, and Jayantilal D. Darji, Richmond, Va., assignors to Degremont, Rueil-Malmaison, France

Filed Apr. 7, 1981, Ser. No. 251,944
Claims priority, application France, Apr. 17, 1980, 80 08579
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—675 20 Claims



1. A method for treating water by ion exchange, said method comprising:
providing within a receptacle a lower bed of mixed anionic and cationic ion exchange resins and an upper bed of cationic ion exchange resins, with said upper bed resting directly on said lower bed without any mechanical separation therebetween;
conducting a water treatment operation by passing water to be treated downwardly through first said upper bed and then said lower bed to thus form treated water, and the discharging said treated water from said receptacle; and
periodically interrupting said water treatment operation and conducting a regeneration operation comprising:
removing said upper bed from said receptacle without removal of said lower bed by exerting pressure on the upper surface of said upper bed, while simultaneously directing a thin substantially horizontal spray of water along a horizontal plane which is adjacent the boundary between said upper and lower beds and which covers substantially the entire horizontal cross-section of said upper bed, and thereby directing said water spray and said cationic resins of said upper bed to an outlet which is located adjacent said boundary;
passing said cationic resins of said upper bed from said outlet to a regeneration vessel and therein regenerating said cationic resins;
introducing regenerated cationic resins into said receptacle to reform said upper bed; and
prior to introducing said regenerated cationic resins into said receptacle, drying said lower bed, to thereby prevent the returning cationic resins from mixing with the resins of said lower bed.

4,349,443

VISCOSIFIER AND FLUID LOSS CONTROL SYSTEM

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 169,884, Jul. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 141,852, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 121,226, Feb. 13, 1980, abandoned. This application Feb. 27, 1981, Ser. No. 239,079

Int. Cl.³ C09K 7/02

U.S. Cl. 252—8.5 A 11 Claims

1. A composition capable of imparting to clay-free aqueous systems a combination of pseudoplasticity and fluid loss control comprising a mixture of:

(a) a hydroxy containing aluminum component formed by mixing in an aqueous medium and under a high degree of agitation of water-soluble basic agent selected from the group consisting of an alkali metal aluminate, alkali metal hydroxide, ammonium hydroxide and mixtures thereof with a water-soluble acidic agent selected from an inorganic acid, aluminum chloride, aluminum sulfate, aluminum nitrate, their hydrates and mixtures thereof; at least one of said basic and acidic agents being an aluminum containing compound: said acidic and basic agents being reacted in a ratio such that the resultant product imparts to said aqueous medium pH of from at least about 8 to about 10.3; in combination with

(b) a reaction product formed in an aqueous acidic medium having a pH of less than about 5.5 between polyvinyl alcohol having a weight average molecular weight of at least 20,000 with at least 1 percent of stoichiometry of a compound containing at least one aldehyde group therein or capable of generating in situ at least one aldehyde group; wherein the amount of component (a) to component (b) is in the weight ratio of at least about 0.75:1.

4,349,444

HYBRID PTFE LUBRICANT INCLUDING MOLYBDENUM COMPOUND

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Continuation-in-part of Ser. No. 158,329, Jun. 10, 1980, Pat. No. 4,284,518. This application Dec. 18, 1980, Ser. No. 218,008

Int. Cl.³ C10M 1/30

U.S. Cl. 252—16 5 Claims

1. A hybrid lubricant additive dilutable in a conventional fluid oil lubricant to provide a working lubricant applicable to metallic working surfaces, such as those found in internal combustion engines and industrial machinery, said hybrid lubricant additive comprising:

A. a dispersion of polytetrafluoroethylene solid lubricant particles;

B. a neutralizing agent added to said dispersion in an amount stabilizing the dispersion to prevent agglomeration of the particles;

C. a fluid oil lubricant carrier intermingled with the stabilized dispersion to provide a predetermined amount of hybrid lubricant additive; and

D. a small but effective amount of an oil-soluble organic molybdenum compound included in said additive to render it effective in forming a solid lubricant layer on said metallic working surfaces.

4,349,445

DITHIOPHOSPHATES AS LUBRICANT ANTIOXIDENTS AND ANTI-CORROSION AGENTS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

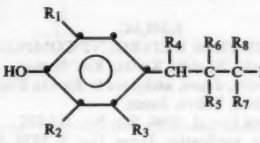
Filed Sep. 15, 1980, Ser. No. 187,641

Claims priority, application Switzerland, Sep. 18, 1979, 8418/79

Int. Cl.³ C10M 1/48; C07C 9/18

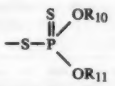
U.S. Cl. 252—46.6 9 Claims

1. A compound of formula I



(I)

wherein R_1 and R_2 independently of one another are each C_1–C_8-alkyl, and R_2 in addition is hydrogen, R_3 is hydrogen or methyl, R_4, R_6 and R_8 independently of one another are each hydrogen or C_1–C_6-alkyl, with the proviso that R_4, R_6 and R_8 as alkyl groups have all together 1 to 6 C atoms, R_9 is hydrogen and one of the radicals R_5 and R_7 is a group of the formula II



(II)

and the other is hydrogen, wherein R_{10} and R_{11} independently of one another are each C_1–C_{22}-alkyl,
or R_{10} and R_{11} together are a group of the formula III

$$-(R_{12})C(R_{13})-[R_{14})C(R_{15})]_m-(R_{16})C(R_{17})- \quad \text{(III)}$$

wherein m is nought or 1, and R_{12}, R_{13}, R_{14}, R_{15}, R_{16} and R_{17} independently of one another are each hydrogen or methyl.

2. A lubricant composition comprising a mineral or synthetic lubricating oil or mixture of said oils, and from 0.001 to 5% by weight, relevant to the oil, of a compound of formula I according to claim 1.

4,349,446

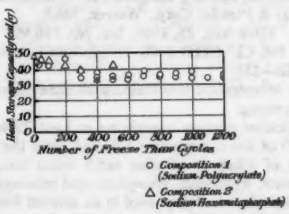
GLAUBER'S SALT HEAT STORAGE COMPOSITIONS, CRYSTAL HABIT MODIFIERS

Stephen B. Marks, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Mar. 5, 1981, Ser. No. 240,787

Int. Cl.³ C09K 3/18

U.S. Cl. 252—70 17 Claims



10. A heat storage composition consisting essentially of:

	Parts by Weight
Attapulgite clay	7–10
Borax	2–6
Sodium sulfate	18–21
Water	23–33

in admixture with one or more crystal habit modifiers selected from sodium hexametaphosphate, alkali metal or ammonium uncrosslinked polycarboxylates, and surface active agents.

4,349,447

PHOSPHATE-FREE DETERGENT COMPOSITION

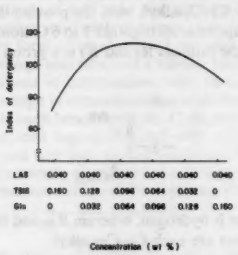
Tatsuhiko Noguchi; Ryuichi Kurita; Ken Nemoto, and Kiichi Endo, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1980, Ser. No. 212,527

Claims priority, application Japan, Dec. 5, 1979, 54-157789

Int. Cl.³ C11D *1/10, 9/10*

U.S. Cl. 252—117 **3 Claims**



1. A detergent composition comprising:

100 parts by weight of a synthetic surface active agent selected from the group consisting of anionic surface active agents, nonionic surface active agents and mixtures thereof; and

an effective amount of a mixture consisting essentially of

30 to 700 parts by weight of an imido-bis-sulfate of the formula $(M^1SO_3)_2NM^2$ wherein M^1 represents lithium, sodium, potassium or ammonium, and M^2 represents hydrogen, lithium, sodium, potassium or ammonium;

3 to 60 parts by weight of sodium palmitate or potassium palmitate; and

1 to 250 parts by weight of at least one compound selected from the group consisting of tetrasodium or tetrapotassium N,N-bis(carboxymethyl)glutamate, and trisodium or tripotassium of N,N-bis(carboxymethyl)phenylalanine.

4,349,448

LOW TEMPERATURE LOW FOAMING ALKALINE CLEANER AND METHOD

Duane C. Steele, Sterling Heights, Mich., assignor to Hooker Chemicals & Plastics Corp., Warren, Mich.

Filed Aug. 25, 1980, Ser. No. 180,999

Int. Cl.³ C11D *1/70, 1/722, 3/075, 3/08*

U.S. Cl. 252—135 **15 Claims**

1. A low temperature low foaming alkaline cleaning composition comprising:

(a) an alkaline portion containing at least 75% by weight (PBW) of the composition selected from the group consisting of alkali or alkaline earth metal borate, silicate, carbonate, hydroxide, phosphate and mixtures thereof;

(b) an ethoxylated alkyl phenol in an amount from about 0.1 to about 15 PBW containing 4 to 14 ethoxy units and 6 to 12 carbon atoms in the alkyl group; and

(c) an ethoxylated and propoxylated alkyl phenol in an amount from about 1 to about 15 PBW containing 4 to 14 ethoxy units; 3 to 18 propoxy units and 6 to 12 atoms in the alkyl group; wherein the sum of (a), (b) and (c) equals 100 PBW.

4,349,449

PROCESS FOR ENHANCING OR AUGMENTING THE AROMA OF DETERGENTS USING NORBORNYL ESTERS

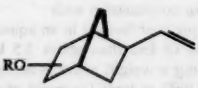
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 247,321, Mar. 25, 1981, Pat. No. 4,315,945, which is a continuation-in-part of Ser. No. 200,012, Oct. 23, 1980, Pat. No. 4,311,861. This application Oct. 13, 1981, Ser. No. 310,909

Int. Cl.³ C11D *3/50*

U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of a mixture of compounds represented by the structure:



wherein in one of the molecules of the mixture the "OR" moiety exists at the "5" position on the norbornyl ring structure and in the other of the molecules of the mixture the "OR" moiety exists at the "6" position on the norbornyl ring structure; and wherein R represents a moiety selected from the group consisting of acetyl and propionyl and wherein in the mixture the R moieties are identical.

4,349,450

CATALYTIC ELEMENTS

James B. Hunter, Newton Square, Pa., assignor to Johnson Matthey, Inc., Malvern, Pa.

Filed Apr. 1, 1981, Ser. No. 249,873

Int. Cl.³ B01J *21/04, 23/40, 35/04*

U.S. Cl. 252—466 PT **3 Claims**

1. A catalytic element for promoting catalyzed chemical reactions comprising a thin-walled metallic member having a plurality of hollow generally frusto-conical projections on a surface thereof, and a catalytically active material supported on the surface of said members, wherein the metallic member is a half-cylindrical shell, slightly tapered toward one end and wherein the outer ends of the projections are slightly jagged, the catalytically active material being present on the entire surface of the element including the outer ends of the projections.

4,349,451

FRYER OIL TREATMENT COMPOSITION AND METHOD

Bernard Friedman, 2914 Fairview St., Allentown, Pa. 18104

Division of Ser. No. 69,238, Aug. 23, 1979, Pat. No. 4,330,564. This application Jun. 9, 1980, Ser. No. 157,849

Int. Cl.³ C11B *3/04, 5/00;* **A23D** *3/04*

U.S. Cl. 252—190 **10 Claims**

1. A composition comprising expanded rhyolitic material and water, said water comprising from about 33 to about 75% by weight of the composition and said rhyolitic material having an average size in the range of from about 8 to about 120 mesh.

4,349,452

CYCLOHEXYLCYCLOHEXANOATES

Maged A. Osman, Zurich, and Laszlo Revesz, Fislisbach, both of Switzerland, assignors to Merck Patent GmbH, Darmstadt, Fed. Rep. of Germany

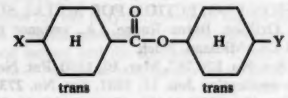
Filed Jul. 15, 1980, Ser. No. 169,135

Claims priority, application Switzerland, Jul. 18, 1979, 6672/79

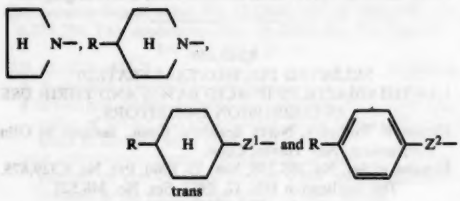
Int. Cl.³ C07C *121/75*; C07D *295/14*; G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299.61 6 Claims

1. An anisotropic compound having the formula



wherein X and Y are each selected from the group consisting of hydrogen, N-monoalkylamino having 1 to 12 carbon atoms in the alkyl portion, halo, cyano, nitro, and cyclic radicals selected from the group consisting of radicals having the following formulas:



wherein R is selected from the group consisting of halogen, cyano and nitro, Z^1 is a carboxyl radical selected from the group consisting of —COO— and —OOC—, and Z^2 is selected from the group consisting of Z^1 and a single covalent bond, with the proviso that:

(a) only one of the groups X and Y is a cyclic radical, and;

(b) neither of the groups X and Y is hydrogen, bromine, or piperidino when the other is hydrogen.

6. A liquid crystal mixture containing at least one anisotropic compound of claim 1.

4,349,453

METHOD FOR PROCESSING ALKALINE SOLUTIONS CONTAINING RADIOACTIVE IODINE DURING REPROCESSING OF NUCLEAR FUELS

Christiane Brugere, Paris; Jean-Pierre Goumondy, Vitry; Jean-Marie Morel, Massy, and Edmond Zellner, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

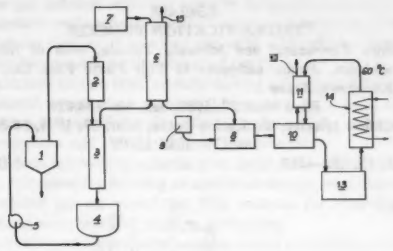
Filed Dec. 10, 1979, Ser. No. 101,546

Claims priority, application France, Dec. 20, 1978, 78 35829

Int. Cl.³ G21C *19/46*; G21F *9/02*

U.S. Cl. 252—627 3 Claims

1. A method for processing alkaline solutions containing radioactive iodine released during reprocessing of nuclear fuels in which irradiated fuels are dissolved in a nitric acid solution, the vapors constituted essentially by nitrogen oxides, iodine and water formed during dissolution are passed into a condenser and then into a first absorption column in which recombined nitric acid is formed, wherein the recombined acid is returned to the dissolved whilst the gases discharged from said first absorption column are passed into a second absorption column in counterflow to an alkaline solution which picks up iodine and nitrous ions from such gases, and wherein the alkaline solution discharged from the second absorption column is passed into a reaction vessel containing a mixture of nitric acid



and sulphamic acid which destroys the nitrous products and releases the iodine.

4,349,454

PREPARATION OF AQUEOUS MEDIUM SUITABLE FOR PREPARING MICROCAPSULES

Hiroshi Iwasaki; Shinsuke Irii, and Mitsuru Kondo, all of Amagasaki, Japan, assignors to Kanzaki Paper Manufacturing Company Limited, Japan

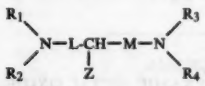
Filed Jan. 28, 1980, Ser. No. 115,915

Claims priority, application Japan, Feb. 14, 1979, 54/16535; Mar. 12, 1979, 54/29654; Oct. 17, 1979, 54/134369

Int. Cl.³ B01J *13/00, 13/02*

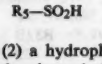
U.S. Cl. 252—312 28 Claims

1. A process for preparing an aqueous medium suitable for preparing microcapsules which comprises dispersing and emulsifying a hydrophobic organic solvent containing a compound represented by the formula

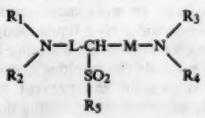


(II)

in an aqueous medium containing (1) sulfinic acid of the formula

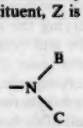


and (2) a hydrophilic protective colloid material to form a diarylmethane derivative represented by the formula



(III)

in the form of a solution of the derivative in droplets of the hydrophobic organic solvent; and wherein L and M are each a 1,4-arylene group with or without a substituent; R_1, R_2, R_3 and R_4 are each alkyl, cycloalkyl, aralkyl or aryl with or without a substituent, Z is a group represented by —O—A,



or —S—D in which A, B, C and D are each hydrogen or a hydrocarbon group with or without at least one hetero atom,

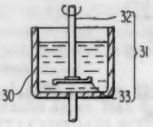
and R_5 is alkyl, cycloalkyl, aralkyl, aryl or heteroaryl with or without a substituent.

4,349,455

EMULSIFICATION PROCESS

Nobuo Yamamura, and Motoaki Takeda, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1980, Ser. No. 134,618
Claims priority, application Japan, Mar. 27, 1979, 54-36045
Int. Cl.³ B01J *13/00*
U.S. Cl. 252—312 **5 Claims**



1. A process for emulsification which comprises producing an oily phase solution of a hydrophobic material in a dissolving-emulsifying tank equipped with a high speed dispersing means by stirring the hydrophobic material directly or dissolving the hydrophobic material or a hydrophobic material and an emulsifying agent in an organic solvent with heating, forming a water-in-oil emulsion of said hydrophobic material by adding water or water and an emulsifying agent to said solution of the hydrophobic material with stirring, continuing the addition of water or water and the emulsifying agent to form an oil-in-water emulsion by phase inversion, adding a water-soluble binder to said oil-in-water emulsion and stirring the emulsion to form the desired oil-in-water emulsion, said hydrophobic material remaining in an emulsified form, whereby substantially all of said hydrophobic material is precluded from precipitating.

4,349,456

NON-VITREOUS CERAMIC METAL OXIDE MICROCAPSULES AND PROCESS FOR MAKING SAME

Harold G. Sowman, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 679,366, Apr. 22, 1976, abandoned. This application Aug. 27, 1979, Ser. No. 69,794
Int. Cl.³ B01J *13/02;* C09K *3/00;* C01G *49/06;* B32B *5/18*
U.S. Cl. 252—317 **29 Claims**

1. A process for making spherical microcapsules comprising the steps of adding percursor material comprising an aqueous solution, dispersion or sol of one or more metal oxides (or compounds calcinable to metal oxide) to a liquid body of a dehydrating agent comprising an organic dehydrating liquid, agitating said liquid body to maintain the resulting droplets of said precursor material in suspension and prevent settling thereof, to maintain relatively anhydrous dehydrating liquid in contact with the surface of said droplets as they are dehydrated, and to rapidly extract within 30 seconds at ambient temperatures of 20° to 40° C. the major amount of water from said droplets and form gelled microparticles therefrom, the predominant amount of said gelled microparticles being in the form of spherical, gelled, porous, liquid-filled microcapsules, recovering said liquid-filled microcapsules, drying the resulting recovered microcapsules at temperatures and pressures adjusted to minimize fracture and bursting the same and remove liquid from within the recovered microcapsules, and firing the resulting dried microcapsules to form spherical ceramic microcapsules the peripheral wall or shell of each which encloses the single hollow within the interior thereof being porous and heat-sealable, homogeneous, and made of non-vitreous ceramic comprising polycrystalline metal oxide or amorphous metal oxide convertible to polycrystalline metal oxide upon firing at higher temperature.

7. Spherical, free-flowing, discrete microcapsules, the peripheral wall or shell of each which encloses the single hollow within the interior thereof being uniformly thick, homogeneous, impermeable, filled with a liquid and made of non-vitreous ceramic consisting essentially of polycrystalline metal oxide or amorphous metal oxide convertible to polycrystalline metal oxide upon firing.

4,349,457

CORROSION PROTECTION FOR METAL SURFACES

Michael T. Orillion, Baton Rouge, La., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 128,767, Mar. 10, 1980, Pat. No. 4,298,657. This application Jun. 15, 1981, Ser. No. 273,817
Int. Cl.³ C23F *11/18, 15/00;* B32B *15/08*
U.S. Cl. 252—389 R **6 Claims**

1. A composition useful for the corrosion-protection of metal surfaces, comprising: a borate salt of an alkali metal, a nitrite salt of an alkali metal, and a molybdate salt of an alkali metal.

2. The composition of claim 1, which further includes an epoxy resin, an epoxy resin hardener, and a thinning agent.

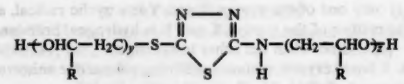
4,349,458

SELECTED POLY(OXYALKYLATED) 1,3,4-THIADIAZOLES IN ACID BATHS AND THEIR USE AS CORROSION INHIBITORS

Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 205,556, Nov. 10, 1980, Pat. No. 4,329,475. This application Feb. 12, 1982, Ser. No. 348,521
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—391 **9 Claims**

1. An acid metal-treating bath comprising an acid and an effective corrosion-inhibiting amount of a poly(oxyalkylated) 1,3,4-thiadiazole having a formula:



wherein each R is individually selected from either H or CH_3; and the sum of y and z is from 2 to about 30.

4,349,459

LOWER PRESERVATION

Cesar Romero-Sierra, Bath, and John C. Webb, Kingston, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 45,126, Jun. 4, 1979, Pat. No. 4,272,571, which is a continuation-in-part of Ser. No. 914,172, Jun. 9, 1978, abandoned. This application Mar. 13, 1981, Ser. No. 243,465
Int. Cl.³ C09K *15/32*
U.S. Cl. 252—400 R **3 Claims**

1. A water-free composition, for the single step preservation of fresh, naturally coloured blooms consisting essentially of (in amounts per liter):

600–700 ml. tert-butyl alcohol
200–250 ml. 2-propanol
3–30 g. thiourea
3–30 g. citric acid
3–30 g. sodium citrate
50–150 ml. propionic acid
0–250 ml. phenol.

4,349,460

CATALYST FOR THE PREPARATION OF POLYLACTAMS

Werner Hartmann, Lindau, Fed. Rep. of Germany, assignor to Harwe AG, Schonenwerd, Switzerland

Continuation of Ser. No. 114,160, Jan. 22, 1980, abandoned, which is a continuation of Ser. No. 951,910, Oct. 16, 1978, abandoned. This application Mar. 24, 1981, Ser. No. 246,974

Claims priority, application Switzerland, Oct. 14, 1977, 12595/77

Int. Cl.[3] C08F *4/08*

U.S. Cl. 252—431 N 2 Claims

1. A catalyst for the polymerization of higher lactam monomers which consists essentially of a homogeneous binary mixture of lauric lactam and the sodium salt of lauric lactam in a ratio of 3.4 to 3.9 moles of said lactam per mole of said sodium salt.

4,349,461

GROUP VIIA METAL-MODIFIED ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 124,408, Feb. 25, 1980, Pat. No. 4,275,256. This application Nov. 14, 1980, Ser. No. 206,777

Int. Cl.[3] B01J *29/36*

U.S. Cl. 252—455 Z 11 Claims

1. A catalyst composition comprising:

a crystalline zeolite material characterized by a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12;.

said composition further comprising at least 0.25 weight percent of one or more Group VIIA metals deposited thereon in the form of the oxide of such metals.

6. The composition of claim 1 wherein said composition further comprises at least 0.25 weight percent phosphorus thereon in the form of phosphorus oxide.

4,349,462

CATALYTIC MATERIAL

Louis J. Velenyi, Lyndhurst, and Serge R. Dolhyj, Parma, both of Ohio, assignors to SOHIO, Ohio

Filed Dec. 24, 1980, Ser. No. 219,781

Int. Cl.[3] B01J *23/70, 21/04, 21/12*

U.S. Cl. 252—455 R 7 Claims

1. A catalytic material comprising a particulate fixed-bed support material, the pore surfaces of the support material being coated with a Group VIII metal, the outside surfaces of said support material being coated with a powdery carbon growth-preventing material capable of preventing growth on said outside surfaces of carbon fibers by the disproportionation of carbon monoxide under conditions in which carbon fibers grow on said Group VIII metal-coated pore surfaces.

2. The catalytic material of claim 1 wherein said growth preventing material is selected from the group consisting of copper oxide, copper metal, aluminum oxide and aluminum metal.

4,349,463

ACETYLENE STORAGE VESSEL

Edith M. Flanigen, White Plains, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 19, 1981, Ser. No. 226,084

Int. Cl.[3] B01J *20/10*; F17C *11/00*

U.S. Cl. 252—457 18 Claims

1. An acetylene storage vessel comprising:

a metal shell;

a hardened asbestos free monolithic calcium silicate filler comprising at least 35 percent by weight crystalline phase and having a porosity of at least about 85 percent disposed in and substantially filling said metal shell for receiving an acetylene gas solution with said porosity being provided by substantially uniformly distributed very fine pores having a size of about 0.05 to 25 microns and with said calcium silicate filler being substantially absent of voids;

said calcium silicate filler material having a fibrous reinforcing material constituting at least 0.5 percent by weight said calcium silicate filler being disposed substantially uniformly throughout said calcium silicate; and wherein

said fibrous reinforcing material is an alkali resistant glass fiber.

12. A method for forming an acetylene storage vessel having a hardened porous monolithic filler material for receiving a dissolved acetylene gas solution comprising:

(a) providing an asbestos free aqueous slurry comprising water, CaO and SiO_2 wherein the weight ratio of CaO to SiO_2 is 0.6 to 1.0;

(b) dispersing an asbestos free settling resistant and reinforcing fibrous material in said slurry said fibrous material being an alkali resistant glass fiber wherein said fiberous material is added in quantity sufficient to constitute at least 0.5 percent of the solids weight of the fiber containing slurry composition with said slurry composition having a water volume percent of at least about 85 percent;

(c) disposing said asbestos free slurry composition in said acetylene storage vessel so as to substantially fill said vessel;

(d) autoclaving said slurry in said acetylene storage vessel at saturated steam pressure and elevated temperature to form said calcium silicate product comprising at least 35 percent by weight crystalline phase with said fibers dispersed substantially uniformly throughout said calcium silicate product and wherein said calcium silicate product substantially fills said acetylene storage vessel;

(e) baking said acetylene storage vessel containing said calcium silicate product until said product has a porosity of at least about 85 percent said porosity being provided by uniformly distributed very fine pores having a size of about 0.05 to 25 microns and being substantially absent voids thereby providing said acetylene storage vessel with said filler product in monolithic form for receiving said dissolved acetylene gas solution.

4,349,464

CATALYSTS FOR METHANOL SYNTHESIS AND METHOD FOR THEIR PRODUCTION

Mark S. Wainwright, Randwick; Warwich L. Marsden, North Sydney, and Jan B. Friedrich, Asquith, all of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Dec. 5, 1980, Ser. No. 213,542

Claims priority, application Australia, Dec. 17, 1979, PE1743

Int. Cl.[3] B01J *21/04, 23/06, 23/72, 25/00*

U.S. Cl. 252—463 9 Claims

1. A method for the production of a low temperature methanol synthesis catalyst composition suitable to synthesise methanol, or a mixture of methanol and dimethyl ether, by the reaction of carbon monoxide or carbon dioxide, or mixtures thereof, with hydrogen, comprising forming an alloy containing from 35% to 60% by weight of aluminium, from 0.1% to 25% by weight of zinc, and the remainder being substantially all copper, and extracting a substantial proportion of the aluminium content of the alloy with an aqueous solution of an alkali metal hydroxide.

4,349,465

PROCESS FOR THE TREATMENT OF COMBUSTIBLE, SOLID RADIOACTIVE WASTES

Günter Krug, Bruchsal; Helfried Lahr, Karlsdorf; Peter Schween, Karlsruhe, and Herbert Wieczorek, Weingarten, all of Fed. Rep. of Germany, assignors to KEWA Kernbrennstoff-Wiederaufarbeitungs-Gesellschaft mbH, Hanover, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,700

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916203

Int. Cl.³ G21F *9/34*

U.S. Cl. 252—626 **8 Claims**

1. In a process for the treatment of solid, combustible radioactive wastes comprising plastic and/or rubber, wherein the wastes are contacted with sulfuric acid of a concentration greater than 16 moles per liter and are reacted with this sulfuric acid at an elevated temperature, and concentrated nitric acid or nitrogen oxides are added to the sulfuric acid, whereby oxidation of the wastes occurs below the surface of the sulfuric acid and gaseous by-products and a solid residue are formed, the improvement comprising:

(1) subjecting the solid wastes, prior to their reaction with sulfuric acid, to mechanical processing which comprises

(a) a preliminary comminution to waste pieces having a size less than or equal to 20 mm, and

(b) a primary comminution by finely grinding the waste pieces produced in step (a) to a size of less than ot equal to 1 mm at a temperature of less than about 123° K.;

(2) forming a suspension of the finely ground waste of step (1) with the sulfuric acid at a temperature of less 313° K.; and

(3) reacting the finely ground waste with the sulfuric acid in said suspension.

4,349,466

PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Yoshihiko Kitaura, Sakurai; Osamu Nakaguchi, Toyonaka; Keiji Hemmi; Matsuhiko Aratani, both of Suita; Hidekazu Takeno, Tenri; Satoshi Okada, Takatsuki; Hirokazu Tanaka; Masashi Hashimoto, both of Takarazuka; Yoshio Kuroda, Takatsuki; Eiko Iguchi, Kanagawa; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

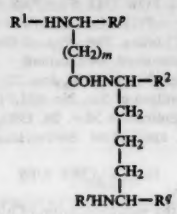
Continuation-in-part of Ser. No. 201,241, Oct. 27, 1980, which is a continuation-in-part of Ser. No. 171,024, Jul. 22, 1980, which is a continuation-in-part of Ser. No. 149,441, May 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 147,710, May 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,020, Jan. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 93,523, Nov. 13, 1979, Pat. No. 4,311,640. This application Jan. 28, 1981, Ser. No. 229,072

Claims priority, application United Kingdom, Nov. 14, 1978, 44346/78; Jul. 31, 1979, 7926705; Oct. 11, 1979, 7935401; Oct. 15, 1979, 793530; Oct. 29, 1979, 7937343; Denmark, Nov. 7, 1979, 4722/79; Australia, Nov. 13, 1979, 52759/79; Canada, Nov. 13, 1979, 339737; Hungary, Nov. 13, 1979, FU 379; European Pat. Off., Nov. 14, 1979, 79104479.5; Japan, Nov. 14, 1979, 54-147275; Rep. of Korea, Nov. 14, 1979, 79-3985; Spain, Nov. 14, 1979, 485.962; Canada, Jul. 22, 1980, 356887; Argentina, Jul. 29, 1980, 281972; Denmark, Jul. 29, 1980, 3272/80; Spain, Jul. 29, 1980, 493.817; Australia, Jul. 30, 1980, 60939/80; Greece, Jul. 30, 1980, 62571; Mexico, Jul. 30, 1980, 8946; European Pat. Off., Jul. 31, 1980, 7926705; Rep. of Korea, Jul. 31, 1980, 80-3063

Int. Cl.³ C07C *103/52;* A61K *37/02*

U.S. Cl. 260—112.5 R **14 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen or acyl;

R^2 and R^9 are each hydrogen, carboxy, protected carboxy, or a group of the formula:

wherein R_a^2 is mono- or di-carboxy or protected carboxy lower alkyl or ar(carboxy or protected carboxy) lower alkyl whose aryl moiety may be substituted by hydroxy, R_b^2 is hydrogen or lower alkyl;

R^9 is hydrogen, carboxy, protected carboxy, with proviso that when one of R^2 and R^9 is hydrogen, then the other is carboxy or protected carboxy or a group of the formula:

wherein R_a^2 and R_b^2 are each as defined above;

R^7 is hydrogen or amino protective group; m is an integer 1 to 3;

or its pharmaceutically acceptable salt.

4,349,467

NONTHROMBOGENIC ARTICLES AND METHOD OF PREPARATION

Joel L. Williams, 1306 Walnut St., Cary, N.C. 27511; Betty J. Dudley, deceased, late of Durham, N.C., and by Kenneth H. Dudley, executor, 5311 Pelham Rd., Durham, N.C. 27713

Continuation-in-part of Ser. No. 888,951, Mar. 22, 1978, abandoned, which is a continuation of Ser. No. 764,474, Jan. 31, 1977, Pat. No. 4,116,898. This application Sep. 17, 1979, Ser. No. 76,200

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.³ A61K *31/75*

U.S. Cl. 525—54.2 **13 Claims**

1. In a method for reducing the thrombogenicity of a solid polymeric resin, which comprises absorbing a quaternary ammonium salt on the surface of the resin and then contacting the surface with the absorbed salt, with a solution of heparin, the improvement which comprises; employing as said solution one containing a concentration of heparin within the range of from about 5 percent by weight to saturation.

4,349,468

STABILIZER FOR POLYOLEFIN RESIN

Yutaka Nakahara, Iwatsuki, and Tohru Haruna, Okegawa, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Continuation of Ser. No. 863,607, Dec. 23, 1977, abandoned. This application Nov. 28, 1980, Ser. No. 211,223

Int. Cl.³ C07C *149/20;* C08K *5/36*

U.S. Cl. 524—302 **10 Claims**

1. A pentaerythritol tetrakis (3-laurylthiopropionate) poly-

olefin stabilizer capable of enhancing the resistance to deterioration and minimizing the formation of undesirable color and odor of a polyolefin resin when heated at 150° C., produced by a process comprising the steps of heating an alpha-olefin having twelve carbon atoms with a beta-mercaptopropionic acid compound selected from the group consisting of beta-mercaptopropionic acid and a lower alkyl ester thereof in the presence of 0.05 to 5 percent by weight of the alpha-olefin and beta-mercaptopropionic acid compound combined of a reaction initiator selected from the group consisting of azonitriles and peroxides to produce a 3-laurylthiopropionic acid compound, esterifying the 3-laurylthiopropionic acid compound with pentaerythritol, and recoverying the pentaerythritol 3-laurylthiopropionate polyolefin resin stabilizer from the mixture.

8. A polyolefin resin composition having enhanced resistance to deterioration and minimized tendency to form undesirable color and odor when heated at 150° C., comprising a polyolefin resin and a stabilizer according to claim 1.

4,349,469
COPOLYESTERETHERS

Burns Davis; Theodore F. Gray, and Harry R. Musser, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1981, Ser. No. 235,385
Int. Cl.³ C08G *63/18*
U.S. Cl. 524—765 **25 Claims**

1. Copolyesterethers having an inherent viscosity of from about 0.8 to about 1.5 comprising

A. a dicarboxylic acid component consisting essentially of 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 70%,

B. a glycol component consisting essentially of

(1) 1,4-cyclohexanedimethanol, and

(2) from about 15 to about 50 weight percent, based on the weight of the polyesterether, of polytetramethyleneether glycol having a molecular weight of about 500 to about 1100 and

C. from about 0.1 to about 1.5 mole %, based on the mole % of the acid or glycol component, of a branching agent having at least three COOH or OH functional groups and from 3 to 60 carbon atoms, said copolyesterether being characterized by having a die swell of between about −90% and about +100% and a minimum crystallization time of less than 2.5 minutes.

4,349,470
PROTEIN POLYMER HYDROGELS

Orlando A. Battista, 3725 Fox Hollow Rd., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 74,014, Sep. 14, 1979, Pat. No. 4,264,493, which is a continuation-in-part of Ser. No. 952,303, Oct. 18, 1978, abandoned. This application Mar. 23, 1981, Ser. No. 246,660
The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.
Int. Cl.³ C07G *7/00*; C08H *1/00, 1/06*; C09H *9/00*
U.S. Cl. 260—117 **25 Claims**

1. The method of preparing a three-dimensional structure comprising forming an aqueous acidic solution of a non-crystalline, natural animal or vegetable protein polymer or mixtures thereof, the polymers having a low molecular weight not exceeding 100,000, heating the solution to a temperature of about 60° C., adding to and incorporating in the solution at least two crosslinking agents while maintaining the solution at a temperature of about 60° C., drying the solution to a moisture content of not more than 10 percent at a maximum temperature of about 35° C. or equivalent under vacuum to form a crosslinked polymer structure, subjecting the structure to thorough washing with water, subjecting the washed structure to dehydration by immersion in a water-miscible organic solvent, subjecting the structure to thorough washing with water and redrying the dehydrated structure to a moisture content of not more than 10 percent.

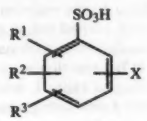
4,349,471
PROCESS FOR THE PREPARATION OF AROMATIC SULPHONIC ACID HALIDES

Heinz U. Blank, Odenthal; Erich Wolters, Niederzier, and Norbert Langenfeld, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,445
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004693
Int. Cl.³ C07C *107/04, 143/70, 107/06, 51/58, 63/04, 63/10, 65/01, 51/16, 51/255, 147/107*
U.S. Cl. 260—208 **19 Claims**

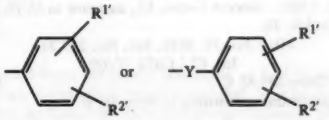
1. A process for the simultaneous preparation of an aromatic sulphonic acid halide and an aromatic carboxylic acid halide or the corresponding carboxylic acid which comprises contacting an aromatic sulphonic acid or an aromatic sulphonic acid anhydride with an aromatic trihalogenomethyl compound in the presence of at least 0.01 mol percent, relative to the aromatic sulphonic acid, of a Brönsted acid or Lewis acid at a temperature of 20° to 300° C., the reaction mixture containing at least half an equivalent of said aromatic trihalogenomethyl compound per equivalent of sulphonic acid.

17. A process according to claim 1, wherein said aromatic sulphonic acid or aromatic sulphonic acid anhydride has in its free acid form the formula



in which

X represents hydrogen,



wherein

Y represent —O—, —SO_2—; —N=N— or —CH_2 and

R^1, R^2, R^3, $R^{1'}$ and $R^{2'}$ independently of one another denote hydrogen, alkyl, cycloalkyl, aryl, aralkyl, hydroxy, alkoxy, acyloxy, halogen, acylamino, n-carbalkoxyamino, N-carbaryloxyamino, nitro, the sulphonic acid group, the carboxylic acid ester group or the urea group and furthermore

two of the radicals R^1 and R^2 and R^3 which are adjacent can be part of a fused-on cycloaliphatic or aromatic ring which is optionally substituted by a sulphonic acid group.

4,349,472
(S)-8(1-ADAMANTANECARBONYLOXY)-7-CHLORO-3-METHYL-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE

Elijah H. Gold, West Orange, and Wei K. Chang, Livingston, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 34,048, Apr. 27, 1979, abandoned. This application Feb. 5, 1980, Ser. No. 118,389
Int. Cl.³ C07D *223/16*; A61K *31/55*
U.S. Cl. 260—239 BB **1 Claim**

1. (S)-8-(1-adamantanecarbonyloxy)-7-chloro-3-methyl-1-

phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine and its pharmaceutically acceptable acid addition salts.

4,349,473

PROCESS FOR THE PREPARATION OF ω-LACTAMS, IN PARTICULAR CAPROLACTAM

Pier P. Rossi, Garlasco, and Mario Catoni, Colleferro, both of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A, Milan, Italy

Filed Oct. 21, 1980, Ser. No. 199,218

Claims priority, application Italy, Nov. 2, 1979, 27018 A/79

Int. Cl.³ C07D *201/10*

U.S. Cl. 260—239.3 A **7 Claims**

1. A process for the preparation of a ω-lactam containing from 5 to 14 carbon atoms, which comprises reacting, in a plurality of stages, a cycloaliphatic acid of the formula:

wherein n=3—13, and/or the corresponding anhydride, with a nitrosating agent in the presence of a dehydrating agent at a temperature of from 30° to 100° C. which is maintained constant throughout the plurality of the reaction stages, and at a molar ratio of the dehydrating agent/the nitrosating agent between 0.7 and 1, substantially all of the dehydrating agent being mixed with the cycloaliphatic acid and/or the corresponding anhydride prior to the reaction with the nitrosating agent, said process being carried out in a manner which prevents substantial accumulation of stationary concentrations of the nitrosating agent in the reaction mass.

6. A process according to claim 1, wherein hexahydrobenzoic acid is reacted with a nitrosating agent in the presence of n-hexane and cyclohexane at a temperature of about 70°-72° C.

4,349,474

2-CYANOSTEROIDS

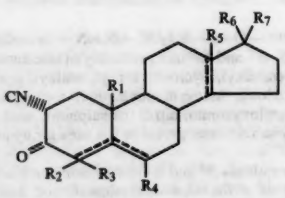
Leland J. Chinn, Morton Grove, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 27, 1981, Ser. No. 287,341

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 C **9 Claims**

1. A compound according to formula I:



wherein R_1 is:
(a) hydrogen; or
(b) methyl;
wherein R_2, R_3 and R_4 is:
(a) hydrogen; or
(b) methyl; with a double bond at either the 4,5 or 5,6-position; R_2, R_3 and R_4 each being the same or different.
wherein R_5 is:
(a) methyl; or
(b) the terminus of a double bond at C—13 and 14;
wherein R_6 is:
(a) hydrogen; or
(b) methyl;
wherein R_7 is:
(a) methyl; or

(b)

wherein R_8 is:
(a) —OCH_2CH_2O—;
(b) —SCH_2CH_2S—; or
(c) =N—O—R_9
wherein R_9 is:
(a) hydrogen; or
(b) alkyl of from one to six carbon atoms, inclusive.

9. 20,20-(1,2-ethylenebisoxy)4,4-dimethyl-3-oxopregn-5-ene-2α-carbonitrile.

4,349,475

PROCESS FOR PRODUCING IMIDAZODIAZEPINES

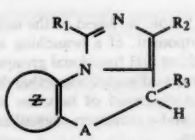
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 242,945

Int. Cl.³ C07D *487/04, 487/14*

U.S. Cl. 260—244.4 **2 Claims**

1. A process to produce a compound of the formula



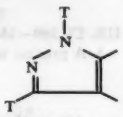
wherein A is

R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, alkoxy lower alkyl, pyridyl, and tolyl; R_2 is selected from the group consisting of hydrogen or lower alkyl; R_3 is selected from the group consisting of hydrogen or lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl, chlorophenyl or tolyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo substituted phenyl, di-halo substituted phenyl, pyridyl and mono-halo substituted pyridyl; and

is selected from the group consisting of

wherein X is chlorine, bromine iodine or hydrogen

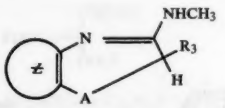
wherein X is chlorine bromine, iodine or hydrogen



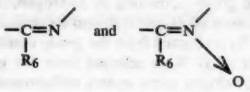
wherein T is hydrogen or lower alkyl

which comprises the following steps in combination

(a) reacting a compound of the formula



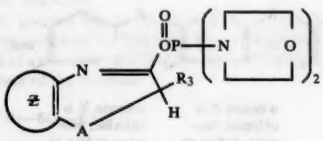
wherein A is selected from the group consisting of



wherein R_3, R_4, R_6 and

are as above; with a compound selected from the group consisting of alkali metal nitrites, alkyl nitrites or a nitrosyl chloride gaseous solution;

(b) condensing either the product from (a) or a compound of the formula



wherein A,

R_4, R_3, R_6 are as above with a nitroalkane anion of the formula R_2—CH—NO_2 wherein R_2 is selected from the group consisting of hydrogen or lower alkyl;

(c) catalytically hydrogenating the product from (b) with H_2/Raney nickel or lithium aluminum hydride with limitation that A is not N-oxide;

(d) acylating the product from (c) with an acid halide or an acid anhydride of the formulas R_1COX or $(R_1CO)_2$ respectively wherein R_1 is as above;

(e) cyclizing the product from (d) with a dehydrating agent selected from phosphorus pentoxide, polyphosphoric acid or an organic or inorganic acid;

(f) dehydrogenating with manganese dioxide, palladium on carbon or potassium permanganate the cyclized product of (e) to produce the final product.

4,349,476

PROCESS FOR PRODUCING IMIDAZODIAZEPINES

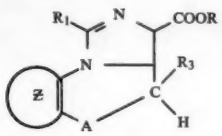
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 242,946

Int. Cl.³ C07D *487/04, 487/14*

U.S. Cl. 260—244.4 **1 Claim**

1. A process to produce a compound of the formula



wherein A is

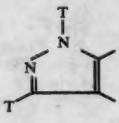
R_1 is selected from the group consisting of hydrogen, lower alkyl, alkoxy lower alkyl, halo lower alkyl; R is hydrogen or lower alkyl; R_3 is selected from the group consisting of hydrogen and lower akyl; R_4 is selected from the group consisting of hydrogen, halogen, cyano, trifluoromethyl, lower alkyl, mono- or di-C_1 to C_7 alkyl or phenyl, chlorophenyl or tolyl substituted amino, amino, hydroxy lower alkyl and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl; and

is selected from the group consisting of

wherein X is chlorine, bromine, iodine or hydrogen

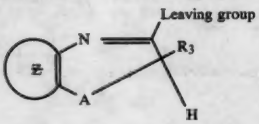
wherein X is chlorine, bromine, iodine or hydrogen

-continued



wherein T is hydrogen or lower alkyl

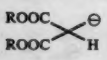
which comprises the stepwise reaction of a compound of the formula



wherein R_3, R_4, R_6, A and

are as above and the leaving group is selected from the group consisting of alkoxides, alkylthio, halo, cyano, phosphate and nitrosoalkylamino

(a) with the anion generated from malonic ester, i.e., a compound of the formula



wherein R is lower alkyl;

(b) decarboxylating with an alkali metal hydroxide the product of (a);

(c) nitrosating with nitrous acid the product of (b);

(d) reducing with H_2/Raney nickel or zinc/acetic acid the product of (c);

(e) reacting the product of (d) with an alkanoic acid ortho ester of the formula

$R_1C(OR)_3$

wherein R is lower alkyl and R_1 is selected from the group consisting of hydrogen, lower alkyl, alkoxy lower alkyl, halo lower alkyl, to produce the final product as an ester, i.e., R=lower alkyl;

(f) if desired, hydrolysing with alkali metal hydroxides the product of (e) to the final product as as acid, i.e., R=hydrogen.

4,349,477

PROCESS FOR PRODUCING IMIDAZODIAZEPINES

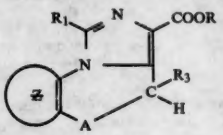
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 243,026

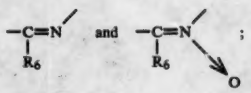
Int. Cl.³ C07D *487/04, 487/14*

U.S. Cl. 260—244.4 **2 Claims**

1. A process to produce a compound of the formula

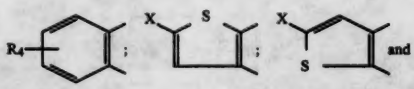


wherein A is



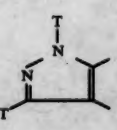
R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, alkoxy lower alkyl, pyridyl, and tolyl; R is hydrogen or lower alkyl; R_3 is selected from the group consisting of hydrogen and lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, hydroxy lower alkyl and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl; and

is selected from the group consisting of



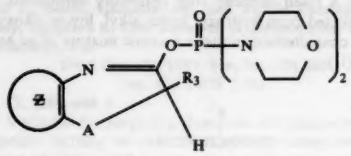
wherein X is chlorine, bromine, iodine or hydrogen

wherein X is chlorine, bromine, iodine or hydrogen



wherein T is hydrogen or lower alkyl

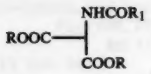
which comprises the stepwise reaction of a compound of the formula



wherein A, R_3, R_4 and

are as above

(a) with the anion generated from acylamino malonic ester, i.e., a compound of the formula



wherein R is lower alkyl and R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, alkoxy lower alkyl, pyridyl and tolyl;

(b) decarboxylating the product of (a) with an alkali metal alkoxide;

(c) dehydrating the product of (b) to produce the final product.

4,349,478

PROCESS FOR THE CARBAZOLATION OF ANTHRIMIDES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 9, 1981, Ser. No. 310,576

Claims priority, application Switzerland, Oct. 14, 1980, 7651/80

Int. Cl.³ C07D *209/86*

U.S. Cl. 260—316 **10 Claims**

1. A process for the carbazolation of anthrimides, which process comprises carrying out the carbazolation reaction by means of a titanium tetrahalide/sulfone complex in an excess of a sulfone of the formula

$R_1—SO_2—R_2$ or

wherein

R_1 and R_2 are each a straight-chain or branched-chain alkyl group having 1 to 4 C atoms, and

X is a straight-chain or branched-chain hydrocarbon chain which has 4 to 10 C atoms and which is unsubstituted or substituted by halogen as the reaction medium.

4,349,479

METHOD OF SALVAGING AROMATIC BISIMIDE VALUES

Tohru Takekoshi, Scotia, and Jimmy L. Webb, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

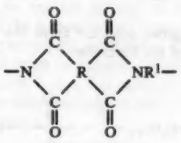
Filed Feb. 26, 1980, Ser. No. 124,914

Int. Cl.³ C07D *403/12*; C07B *29/00*; C07D *403/06, 487/04*

U.S. Cl. 260—326 N **7 Claims**

1. A method which comprises:

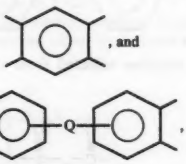
(1) heating at a temperature in the range of from 100° C. to 300° C., a mixture comprising aromatic polyimide consisting essentially of chemically combined units of the formula,



a $C_{(1-12)}$ alkyl amine and water, where sufficient alkyl amine as utilized in the mixture to substantially maintain stoichiometric equivalence between the alkyl amine and units of polyimide and

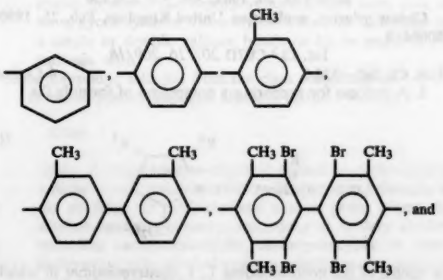
(2) recovering aromatic bis(N-alkylimide) from the mixture of (1),

where R is a $C_{(6-30)}$ tetravalent aromatic organic radical selected from



where Q is selected from —O—, —S—,

and —O—R^2—O— and R^2 is a divalent organic radical selected from



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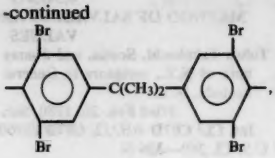
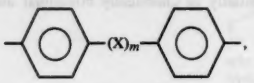
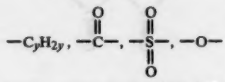


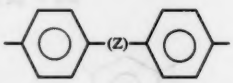
and organic radicals of the formula,



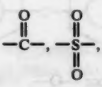
where X is a member selected from the class consisting of divalent radicals of the formulas:



and —S—, where m is 0 or 1 and y is a whole number from 1 to 5, and R^1 is a $C_{(2\text{-}20)}$ divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals having from 2–20 carbon atom, and (c) divalent radicals of the formula,



where Z is a member selected from the class consisting of —O—,



—S—, $—C_xH_{2x}—$ and x is a whole number from 1 to 5 inclusive.

4,349,480

PROCESS FOR PREPARING 1-(3-BROMO-2-ALKYLPROPANOYL-L-PROLINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

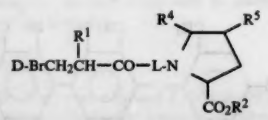
Filed Feb. 20, 1981, Ser. No. 236,350

Claims priority, application United Kingdom, Feb. 26, 1980, 8006414

Int. Cl.³ C07D *207/16, 209/18*

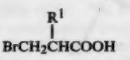
U.S. Cl. 260—326.2 **4 Claims**

1. A process for preparing a compound of formula (I)



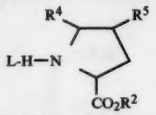
(I)

in excess of the corresponding L, L diastereoisomer in which the quantity of D,L-diasterioisomer exceeds the L,L-diastereoisomer at least by about 2:1 wherein R^1 is lower alkyl, R^2 is a carboxy protecting group, R^4 and R^5 either are both hydrogen or together with the carbon atoms to which they are attached represent a fused benzene ring optionally substituted by a group selected from hydroxy, lower alkyl, lower alkoxy and halogen, characterised in that a racemic mixture of an acid of formula (II)



(II)

is reacted with a carbodiimide or carbonyl diimidazole coupling agent and a compound of formula (III)



(III)

in which formulae R^1, R^2, R^4 and R^5 are as defined above.

4,349,481

TRITIATED GIBBERELLIN ALDEHYDES

Manfred Lischewski, Halle-Neustadt; Habil G. Adam, Halle, both of German Democratic Rep., and Edward P. Serebryakov, Moskav, U.S.S.R., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Filed Oct. 15, 1979, Ser. No. 24,780

Claims priority, application German Democratic Rep., Apr. 13, 1978, 204770

Int. Cl.³ C07D *307/00*

U.S. Cl. 549—297 **13 Claims**

1. [15-^{2}H]-gibberellin-(7)-aldehydes.

4,349,482

PROCESS FOR MAKING VICINAL EPOXIDES AND DIHALIDES

James M. Renga, and Albert H. Emmons, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

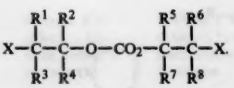
Continuation-in-part of Ser. No. 95,002, Nov. 16, 1979, Pat. No. 4,261,906. This application Feb. 25, 1981, Ser. No. 238,188

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.³ C07D *301/02*

U.S. Cl. 549—518 **10 Claims**

1. A process for making a vicinal epoxide and an alkylene dihalide which comprises contacting a carbonate ester of the formula



wherein the R groups are individually hydrogen, a hydrocarbon group, $—CH_2X$, $—CH_2Y$ and each of the pairs R^1, R^2 and R^5, R^6 may together form an alkylene group of 3–6 carbon atoms, each X is Cl or Br, and Y is an alkoxy or aroxy group, with a quaternary ammonium or phosphonium salt catalyst at about 25° C.–250° C. and separating said epoxide from the reaction mixture.

4,349,483
PROCESS FOR THE PREPARATION OF ALUMINUM TRIHYDROCARBYLS

David L. Beach, Gibsonia, Pa., and Adolfo Zambelli, Milan, Italy, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 221,063
Int. Cl.[3] C07F 5/06
U.S. Cl. 260—448 A 22 Claims

1. A process for preparing aluminum trihydrocarbyls which comprises reacting an organo magnesium compound with a mixture of chlorinated and brominated aluminum compounds to obtain a magnesium halide containing both chlorine and bromine and aluminum trihydrocarbyls and then recovering said aluminum trihydrocarbyls.

4,349,484
PROCESS FOR THE MANUFACTURE OF MIXTURES OF DIPHENYLMETHANE DIISOCYANATES AND POLYPHENYL POLYMETHYLENE POLYISOCYANATES

Franz Merger, Frankenthal; Gerhard Nestler; Friedrich Towae, both of Ludwigshafen, and Wolfgang Harder, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,890
Int. Cl.[3] C07C 119/048
U.S. Cl. 260—453 P 11 Claims

1. A process for the preparation of mixtures of diphenylmethane diisocyanates and polyphenyl polymethylene polyisocyanates comprising the steps of

A. reacting aniline with an O-alkylcarbamate to form N-phenylurethane;

B. separating ammonia and other by-products from the N-phenylurethane;

C. condensing, in the presence of an acid, the resultant N-phenylurethane with formaldehyde or bifunctional compounds having the formula

$$X—CH_2—X$$

in which X stands for a RO—, RS— or ROCO radical and R denotes an alkyl radical to form mixtures of methylene bis(phenylurethanes) and polymethylene polyphenylurethanes;

D. cleaving the mixtures of methylene bis(phenylurethanes) and polymethylene polyphenylurethanes at temperatures of 175° C. to 600° C.; and

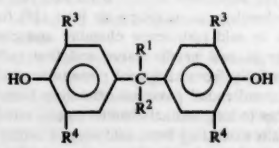
E. isolating the mixtures of diphenylmethane diisocyanate and polyphenyl polymethylene polyisocyanates resulting from step D.

4,349,485
CATALYTIC AROMATIC CARBONATE PROCESS USING MANGANESE TETRADENTATE REDOX CO-CATALYSTS

John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1979, Ser. No. 97,431
Int. Cl.[3] C07C 68/04
U.S. Cl. 260—463 22 Claims

1. An aromatic carbonate process wherein an aromatic phenol of the formulas



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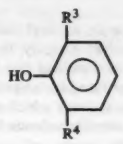
or



wherein independently each R^1 and R^2 is hydrogen, C_{1-4} alkyl or phenyl and independently each R^3 and R^4 is hydrogen or C_{1-4} alkyl, carbon monoxide, a base, a Group VIIB element selected from ruthenium, rhodium, palladium, osmium, iridium or platinum, and an oxidant having an oxidation potential greater than that of the said selected Group VIIIB element are contacted, the improvement comprising the use of a redox co-catalyst selected from manganese tetradentates of the formula $(L)_xMn$ wherein L is a $C_{14-20}H_{22-34}O_4$ bis(β-diketone), Mn is the transition metal manganese, and x is a positive integer at least equal to about 1.0.

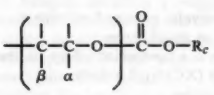
4,349,486
MONOCARBONATE TRANSESTERIFICATION PROCESS

Daniel J. Brunelle, Scotia, and William E. Smith, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

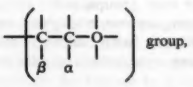
Continuation-in-part of Ser. No. 969,683, Dec. 13, 1978, abandoned. This application Oct. 31, 1980, Ser. No. 202,571
Int. Cl.[3] C07C 68/06
U.S. Cl. 260—463 10 Claims

1. A monocarbonate transesterification process comprising reacting, in the presence of a base;

(A) a beta-fluoroaliphatic carbonate which is saturated, unsaturated, linear or branched compound of the formula,



where R_c is selected from the class of a group of the formula,



group,

an alkyl radical, a cycloalkyl, aryl radical and combinations thereof which can be carbo-monocyclic, carbo-polycyclic or fused carbo-polycyclic and can have two or more cyclic systems which are connected to each other by a single or double valence bonds or bi- or multi-valent radicals, with

(B) a compound selected from the class consisting of

(1) monohydroxy aliphatic alcohols of the formula,

$$R^1OH$$

where R^1 represents an aliphatic radical or cycloaliphatic radical having a single —OH radical attached directly to the aliphatic or cycloaliphatic carbon atom where the alcohol can be a primary, secondary or tertiary alcohol including carbo-monocyclic, carbo-polycyclic or fused carbo-polycyclic alcohol systems which are connected to each other by single or double valence bonds or bi- or multi-valent radicals;

(2) monohydroxy phenol

R_bOH

wherein R_b represents an aryl radical having a single —OH radical attached directly to an aryl ring carbon atom wherein the aryl radical can be carbo-monocyclic, carbo-polycyclic, or fused carbo-polycyclic, and can have two or more cyclic systems which are connected to each other by single or double valence bonds or bi- or multi-valent radicals; and

(3) an ortho-positioned dihydroxy aromatic compound of the formula,

$R_c(OH)_n$

wherein R_c represents an aromatic radical having at least two —OH radicals ortho-positioned relative to each other, each hydroxy group being directly attached to adjacent aromatic ring carbon atoms, n being a number at least equal to 2 wherein the R_c radical can be carbo-monocyclic, carbo-polycyclic, and can have two or more cyclic systems connected to each other by single or double valence bonds, or bi- or multi-valent radicals.

4,349,487

PROCESS FOR FORMING ETHERS

James M. Renga, and Pen-Chung Wang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1981, Ser. No. 295,428
Int. Cl.³ C07C *121/75, 41/01, 79/35*
U.S. Cl. 260—465 F **10 Claims**

1. A process for forming ethers of phenolic compounds comprising contacting a phenolic compound of the formula $Ar(OH)_x$ with methyl trichloroacetate and either a primary alkyl halide or an aromatic halide in the presence of a catalytic amount of an initiator at a temperature from about 100° C. to about 180° C. wherein:

Ar is any aromatic carbocyclic group of valence x;

x is an integer from one to about three;

the primary alkyl halide is a compound of up to about 20 carbons of the formula $(XCH_2)_nR$ where:

X is chloro, bromo or iodo;

n is one or two; and

when n is one, R is an alkoxy, aryloxy, cyano, nitro, ester, alkyl, aryl or aralkyl group, or an alkyl, aryl or aralkyl group further substituted with alkoxy, polyalkoxy, aryloxy, cyano, nitro or ester groups; and

when n is two, R is alkylene, arylene, aralkylene, or such groups further substituted with alkoxy, alkoxy(-poly)alkyleneoxy, aryloxy, cyano, nitro or ester groups; and

the aromatic halide is a compound of up to about 20 carbons of the formula $R'-(X)_m$ where:

R′ is an aromatic group containing at least one benzene ring structure substituted with at least one strongly electron-withdrawing group located ortho or para to X;

X is previously defined; and

m is one or two.

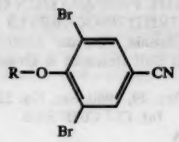
4,349,488

PROCESS FOR PRODUCING ESTERS OF 3,5-DIBROMO-4-HYDROXYBENZONITRILE

David A. Dentel, and David C. Sanders, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Nov. 3, 1981, Ser. No. 317,613
Int. Cl.³ C07C *121/75*
U.S. Cl. 260—465 D **10 Claims**

1. A process for producing 2,6-dibromo-4-cyanophenyl esters of the formula:



where R is a member selected from the group consisting of an acyl group derived from aliphatic and haloaliphatic carboxylic acids containing 3 to 12 carbon atoms and mononuclear aromatic and haloaromatic carboxylic acids, comprising the steps of:

reacting 4-hydroxybenzonitrile with bromine at elevated temperatures in the presence of an inert solvent and a catalytic amount of a basic heterocyclic aromatic compound or hydrohalide thereof;

thereafter removing unreacted bromine from the reaction mixture;

contacting the reaction mixture under anhydrous conditions while maintaining an elevated temperature with an acyl halide of the formula R-X, where X is a member selected from the group consisting of chlorine and bromine and where R is given above; and

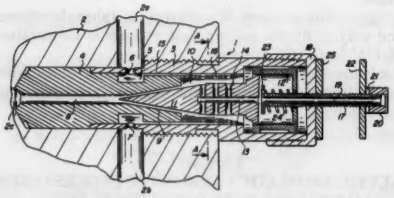
recovering the ester thereby produced from the reaction mixture.

4,349,489

JET FOR THE PRODUCTION OF A VAPORIZED IDLING MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Alain Gaget, Bonnecoste-Cales, 46200 Souillac, France, and Guy Juillot, Malmort, France, assignors to Alain Gaget, Souillac, France

PCT No. PCT/FR80/00095, § 371 Date Mar. 26, 1981, § 102(e) Date Mar. 26, 1981, PCT Pub. No. WO81/00281, PCT Pub. Date Feb. 5, 1981
PCT Filed Jun. 16, 1980, Ser. No. 247,717
Claims priority, application France, Jul. 26, 1979, 79 19281
Int. Cl.³ F02M *3/08*
U.S. Cl. 261—41 D **4 Claims**



1. An idling jet for an auxiliary slow-running carburetor comprising a slow-running air inlet (A_r), a vaporized mixture outlet (M_c), a fuel inlet (C_r), a mixing chamber (5) in communication with said air inlet and said mixture outlet, a turbulence chamber (10) having a fixed seat (9) and a movable needle valve (11) positioned in said turbulence chamber (10), said needle and said seat forming a gap of variable cross-section for controlling the axial flow of fuel from said fuel inlet to said turbulence chamber, an auxiliary air inlet (19) for supplying auxiliary air to said turbulence chamber and comprising an axial passage in said needle valve and first radial passages extending radially from said axial passage to said turbulence chamber, second radial passages extending from said turbulence chamber to longitudinal channel means, said longitudinal channel means extending from said second radial passages to said mixing chamber.

4,349,490

PROCESS OF AND APPARATUS FOR CURVING A CASING OF STRETCHED PLASTIC MATERIAL

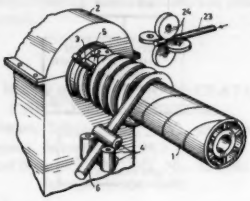
Arnold Bos, Zolder, Belgium, assignor to International Chemical Engineering Establishment, Vaduz, Liechtenstein

Filed Aug. 28, 1980, Ser. No. 182,298

Claims priority, application Netherlands, Aug. 30, 1979, 7906525

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—25 12 Claims



1. A process for curving an elongated, dry, inflated casing of plastic material, comprising the steps of:

heating the surface of a cylindrical mandrel;

winding said casing helically on said cylindrical mandrel so that the adjacent windings contact one another;

heating the inner surface of the casing windings, due to their engagement with said cylindrical mandrel;

supplying heated air to the externally exposed surfaces of said casing as said casing is wound onto said cylindrical mandrel and for a first period of time thereafter;

maintaining said casing in contact with said heated cylindrical mandrel surface for at least a second period of time following said first period of time; and

removing said casing from said cylindrical mandrel following said second period of time, including coaxially tucking up said casing on an elongated stripping mandrel by rotationally driving a plurality of stripping rollers disposed around and adjacent said stripping mandrel.

7. An apparatus for curving an elongated, dry casing of plastic material, comprising:

a cylindrical mandrel supported for rotation about its central axis;

means for heating the surface of said cylindrical mandrel;

means for releasably fastening a leading end of said casing to said cylindrical mandrel;

means for supplying a fluid to the interior of said casing to inflate it;

means adjacent and supported for movement axially of said cylindrical mandrel for supplying said casing thereto under tension;

drive means for rotating said cylindrical mandrel and for moving said casing supply means axially along said cylindrical mandrel at a speed corresponding to the speed of rotation of said cylindrical mandrel so that said casing is wound helically on said cylindrical mandrel with adjacent windings contacting each other;

housing means encircling said cylindrical mandrel, having an axial length substantially less than that of said cylindrical mandrel, and movable axially of said cylindrical mandrel with and immediately following said casing supply means under control of said drive means for immediately and substantially enclosing the portion of said casing most recently wound on said cylindrical mandrel for a first period of time;

means for supplying heated air to said housing means; and

means for removing said casing from said cylindrical mandrel at least a second period of time after said housing means has axially passed said casing, including a stripping assembly having a stripping mandrel substantially perpendicular to the axis of said cylindrical mandrel and a plurality of rotationally driven stripping rollers provided around and adjacent the end of said stripping mandrel which is adjacent the axis of said cylindrical mandrel, said rotationally driven stripping rollers coaxially tucking up said casing onto said stripping mandrel;

whereby the externally exposed surfaces of said casing are heated by said heated air in said housing means only for said first period of time after said casing is wound on said cylindrical mandrel, and the surfaces of said casing adjacent said cylindrical mandrel are heated by said cylindrical mandrel for said first period of time after said casing is wound on said cylindrical mandrel and for at least said second period of time following said first period of time.

4,349,491

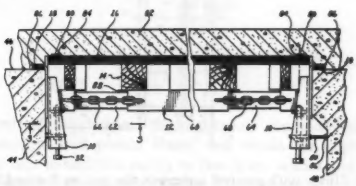
METHOD FOR FORMING A CONCRETE DECK

Everett A. Eyden, P.O. Box 1873, Sedona, Ariz. 86336

Filed Mar. 25, 1980, Ser. No. 133,904

Int. Cl.³ E04B *1/16*

U.S. Cl. 264—35 7 Claims



1. A method for forming a concrete slab-deck extending across a span intermediate two support members, the deck being supported during curing thereof by decking supported by deck joists and ledgers, said method comprising the steps of:

(a) detachably suspending a hanger from each of the support members in opposed relationship to one another, each of the hangers including a ledger support plate vertically adjustable from the top and bottom of the hanger;

(b) laying an extendable and contractable ledger between and supported by the ledger support plates of each opposed pair of the hangers;

(c) locking the length of each ledger;

(d) positioning the deck joists and decking upon the ledgers;

(e) adjusting the ledger support plates of each of the hangers from the top to raise the corresponding ends of the ledgers and locate the decking at a predetermined orientation across the span;

(f) pouring said concrete upon the decking and allowing the concrete to cure and to form the concrete slab deck;

(g) relocating the ledger support plates of each of the hangers from the bottom to lower the corresponding ends of the ledgers;

(h) removing the ledgers from engagement with the respective hangers;

(i) dismantling the deck joists and decking; and

(j) detaching the hangers from their respective support members.

4,349,492

METHOD OF PUTTING IN A PARTITION OF INSULATION MATERIAL INSIDE CONCRETE WALLS WHICH ARE CAST IN A VERTICAL POSITION IN AN INDUSTRIAL BUILDING SITE

Dan Shoham, 67/D Rothschild Blvd., Haifa, Israel

Filed Jan. 27, 1981, Ser. No. 228,758

Claims priority, application Israel, Feb. 7, 1980, 59332

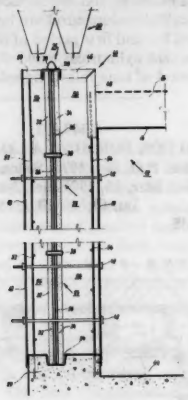
Int. Cl.³ C04B *15/00*

U.S. Cl. 264—35 10 Claims

1. A method of constructing in-situ cast concrete, internally insulated building walls, comprising the steps of:

(a) erecting a wall mold having a pair of vertical, spaced, mold plates;

(b) introducing between, distanced from, and extending from bottom to top of the mold plates, an assembly comprising a rigid back-up panel and at least one board of insulating material releasably attached to one side of said panel;



(c) filling with poured concrete the spaces formed between said mold plates and said assembly; and

(d) before the concrete hardens, extracting said panel from the cast wall so that said board remains and becomes embedded in the concrete.

4,349,493

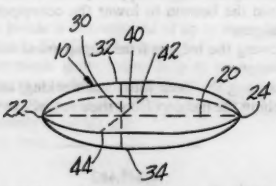
BRIQUETS OF HYDRATED CALCIUM HYPOCHLORITE

John M. Casberg, Cheshire, and Clair H. Putnam, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 956,543, Nov. 1, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 219,089

Int. Cl.³ B01J 2/00

U.S. Cl. 264—37 6 Claims



1. A process for producing briquets of hydrated calcium hypochlorite having from about 55 to about 75 percent by weight of $Ca(OCl)_2$, a water content of from about 4 to about 10 percent by weight, which comprises:

(a) feeding particles of hydrated calcium hypochlorite to a briquetting means,

(b) applying roll pressures in the range of from about 35 to about 210 kilograms per square meter to form briquets of said hydrated calcium hypochlorite particles, and

(c) recovering said briquets from said briquetting means.

4,349,494

METHOD OF MAKING A FIRE-RETARDANT PRODUCT HAVING A FOAMED LORE AND A FIRE-RETARDANT PROTECTIVE LAYER

Glenn E. Fulmer, Clarksville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 36,955, May 7, 1979, Pat. No. 4,254,177. This application Mar. 17, 1980, Ser. No. 130,778

Int. Cl.³ B29D 27/04; C08G 18/14; C08J 9/34; C09K 3/28

U.S. Cl. 264—45.3 19 Claims

PROVIDE A FOAMED CORE STRUCTURE
APPLY AROUND THE CORE A HYDROPHILIC POLYURETHANE FOAM FORMING LAYER CONTAINING FIRE RETARDANTS WITHOUT USING ANY ADHESIVE
FORM A PROTECTIVE FIRE RETARDANT FOAM LAYER AROUND THE CORE

1. A method of increasing the fire-retardant property of a foraminous, foamed core structure susceptible to burning comprising

providing a foamed core structure having an outer surface susceptible to burning, and

applying around the outer surface of the core structure, in the absence of any binder material on the core structure, a hydrophilic polyurethane foam forming layer containing a large amount of fire-retardant fillers,

whereby a protective foam layer surrounding the outer surface of the foraminous structure core is formed which adheres to the core due to the adhesive nature of the polyurethane as is foams around the foraminous core in combination with the mechanical interlock obtained as said polyurethane foam flows into the foraminous core upon foaming.

4,349,495

METHOD OF PRODUCING THERMALLY INSULATED COMPOSITE SECTIONS, AND A COMPOSITE SECTION PRODUCED BY THIS METHOD

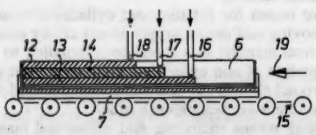
Manfred Mühle, Tulpenstrasse 11, D-4972 Löhne 2, Fed. Rep. of Germany

Filed Jul. 14, 1980, Ser. No. 168,407

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928574

Int. Cl.³ B29D 27/04

U.S. Cl. 264—45.8 5 Claims



1. A method of producing thermally insulated composite sections, comprising the steps of: holding at least two metal sections spaced apart to form a free space which is sealed at the bottom and which has an open side; filling said free space from its open side with first insulating material layers which are at first in liquid form and then harden to form a porous structure; introducing second solid insulating material layers for positively and frictionally joining together the metal sections and first insulating layers in alternating succession into said free space formed between the metal sections, each layer only partly filling said free space; the step of introducing the second solid insulating material layers and the first insulating layers

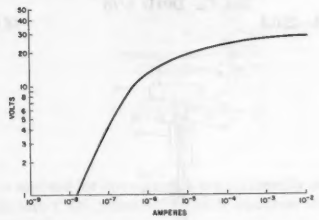
being carried out with a plurality of inlet nozzles whose actions are chronologically staggered, said inlet nozzles being disposed one behind the other in operating direction of the filling operation; and using for the first insulating layers the same material as for the second solid insulating material layers, a blowing agent which provides the first insulating layers with their porous structure being contained in the material for the first insulating layers; closing the free space at the top and also at the ends of the metal sections by a self-adhesive cover strip; placing a channel-shaped guide section over the metal sections to form a composite section; turning the guide section together with the metal sections through an angle of substantially 180°, so that the guide section lies at the bottom; and sealing said free space at the bottom.

4,349,496

METHOD FOR FABRICATING FREE-STANDING THICK-FILM VARISTORS

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,964
Int. Cl.³ H01C 7/10
U.S. Cl. 264—61 **16 Claims**



1. A method of fabricating a free-standing, thick-film varistor comprising the steps of:
- mixing unsintered metal oxide varistor powder with a carrier material to form a paste;
- applying a substantially uniform thin film of said paste onto a surface of an aluminum oxide substrate;
- sintering said thin paste film on said aluminum oxide substrate to form a varistor material; and
- separating said varistor material from said aluminum oxide substrate to form said free-standing, thick-film varistor.

4,349,497

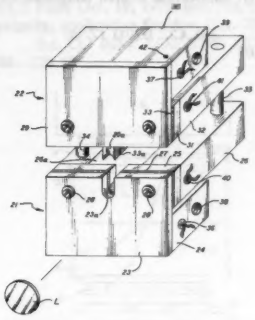
FIBER OPTIC TERMINATION METHOD AND APPARATUS

Paul A. Blackington, Vandling, Pa., assignor to Sheltered Workshop for the Disabled, Inc., Binghamton, N.Y.

Continuation-in-part of Ser. No. 128,934, Mar. 10, 1980, abandoned. This application Apr. 8, 1981, Ser. No. 252,087
Int. Cl.³ B29C 27/02; B29D 11/00
U.S. Cl. 264—1.5 **16 Claims**

1. The method of fusing together end portions of a bundle of plastic optic fibers to form a cable end, comprising the steps of: containing a first length portion of said bundle adjacent the ends of said fibers within a first cavity with the ends of said fibers exposed at an end of said first cavity; containing a second length portion of said bundle adjacent said first length portion within a second cavity; heating said second length portion of said bundle to a predetermined temperature slightly below the deformation temperature of said plastic fibers; and applying heat to said first length portion for a time sufficient to fuse said fibers within said first length portion while maintaining the temperature of said second length portion substantially constant at said predetermined temperature.

8. Apparatus for fusing together end portions of a bundle of plastic optic fibers to form a cable end having improved light transmission per unit area, comprising, in combination: first means defining a first cavity which is closed except at first and second ends and which has a uniform cross-section between said first and second ends; second means defining a second cavity having a first end registering with the second end of said first cavity, said first means and said second means each comprising first and second relatively movable members movable toward each other to contain a respective length portion of said bundle of fibers; means for heating said second means to a



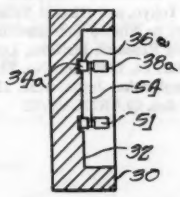
predetermined temperature slightly below the deformation temperature of said plastic fibers; and means for applying sufficient heat to said first cavity to fuse fibers within said first cavity without substantially varying the temperature of said means defining said second cavity, whereby end portions of fibers within said first cavity may decrease in length and increase in diameter to provide a fused cable end having said cross-section.

4,349,498

RADIO-OPAQUE MARKERS FOR PYROLYTIC CARBON PROSTHETIC MEMBERS

Willard H. Ellis, Leucadia, Calif.; Axel D. Haubold, Liberty Hill, Tex.; Victor Slivenko, San Diego, Calif., and Jack C. Bokros, Austin, Tex., assignors to Carbomedics, Inc., Austin, Tex.

Filed Jan. 16, 1981, Ser. No. 225,804
Int. Cl.³ A61F 1/22
U.S. Cl. 264—81 **10 Claims**



1. A method of forming a pyrolytic carbon prosthetic member having a marker fully encased in pyrolytic carbon comprising;
- forming a mandrel having a surface on which the member is to be created,
- providing an insert having a pyrolytic carbon portion and a marker joined thereto,
- affixing said insert to said mandrel so that said marker extends above said surface, and
- depositing pyrolytic carbon on said mandrel to a desired thickness sufficient to fully encase said marker therein,
- removing undesired portions of said mandrel, and

finishing the shaping of said deposited pyrolytic carbon to form a prosthetic member.

4,349,499

DISC RECORD PREPARATION

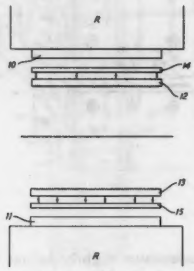
Samuel J. B. Johnston, Ashford, England, assignor to E M I Limited, Hayes, England

Filed Dec. 11, 1980, Ser. No. 215,258

Claims priority, application United Kingdom, Dec. 21, 1979, 7944236

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **5 Claims**



1. A method of manufacturing a modulated disc record comprising the steps of, providing a stamper plate bearing modulations at one surface only representing information or data to be recorded,

securing the stamper plate between mould blocks mounted between the rams of a press and then moulding a recording medium comprised solely of a thermoplastics material to impart thereto a positive impression of the data or information, the method being characterised in that

before the stamper plate is so secured a plastics material foil is bonded to the unmodulated surface of the stamper plate or to the surface of the mould block facing the stamper plate.

4,349,500

METHOD FOR STRETCHING A FIBROUS OR FILM-LIKE MATERIAL

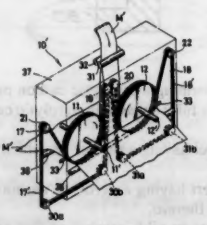
Masahide Yazawa, Kunitachi; Haruhisa Tani; Kazuhiko Kurihara, both of Tokyo, and Hiroshi Yazawa, Kunitachi, all of Japan, assignors to Nippon Petrochemicals Co., Ltd. and Polymer Processing Research Institute, Ltd., both of, Japan

Filed Mar. 24, 1980, Ser. No. 133,146

Claims priority, application Japan, Mar. 22, 1979, 54-34027

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—159 **4 Claims**



1. A method of transversely stretching a longitudinally running continuous strip of organic synthetic thermoplastic polymeric material, which comprises the steps of:

(a) gripping the strip at its opposite selvages respectively between (i) the periphery of each of a pair of symmetrically disposed pulleys of substantially the same dimensions rotating at substantially the same peripheral speed in the same plane but in opposite directions and (ii) each of a pair of endless belts respectively trained around and running with said pulleys, said pulleys and said belts forming two divergent arcuate paths therebetween;

(b) stretching the gripped strip, while being heated, transversely by moving the selvages along the respective arcuate paths over a predetermined circumferential distance of from approximately a quarter to approximately a half of the full circumference of said pulleys; and

(c) releasing the stretched strip from between said pulleys and belts for cooling to set.

4,349,501

CONTINUOUS SPIN-DRAW POLYESTER PROCESS

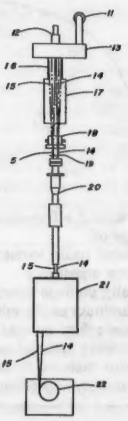
Maxwell C. Hamlyn, Cary, N.C., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 42,188, May 24, 1979, Pat. No. 4,251,481. This application Feb. 6, 1981, Ser. No. 232,448

The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.

Int. Cl.³ D01D *5/16*

U.S. Cl. 264—210.3 **18 Claims**



1. A process for the simultaneous spin-drawing of one or more ends of multifilament, continuous filament, synthetic polyester fiber, comprising the steps of:

(a) supplying a melt of polyester polymer to a spinning unit;

(b) extruding the melt through a spinnerette having a plurality of extrusion orifices to form filaments;

(c) advancing the extruded filaments through a substantially stationary column of air contained in a heated sleeve having a temperature of about 200° C. to 450° C.

(d) advancing the filaments through a quenching zone;

(e) lubricating the filaments;

(f) passing the lubricated filaments over a forwarding roll system maintained at a temperature of less than 50° C.;

(g) subsequently passing the filaments through a steam impinging draw point localizing jet at a steam temperature of about 482° C. to 580° C. to heat the filaments substantially immediately above their second order transition temperature;

(h) passing the filaments over a pair of draw rolls wherein at least one of the draw rolls is maintained at a temperature between about 170° C. and 237° C.;

(i) passing the filaments over a relax roll system maintained at a temperature between about 60° C. to 230° C., yarn

tension to the relax roll system being maintained at about 0.2 to 2.0 grams per denier; and

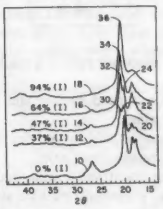
(j) winding up the filaments at a tension of from about 0.06 to 1.0 gram per denier; whereby a reduced shrinkage, dimensionally stable fiber is produced.

4,349,502

FABRICATION METHOD FOR UNORIENTED PHASE-I PVF_2

Kook D. Pae, East Brunswick; Brian A. Newman, Highland Park, and Jerry I. Scheinbeim, Somerset, all of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1980, Ser. No. 200,172
Int. Cl.[3] B29C *25/00*
U.S. Cl. 264—320 7 Claims



1. A method for converting a predominantly phase II PVF_2 sample into PVF_2 phase I crystalline structure which includes the steps of:

placing said PVF_2 sample in a high pressure cell;

applying high pressure at least 2 kilobars to said sample in said high pressure cell;

heating said sample in said high pressure cell to bring the temperature thereof close to a melting point of said PVF_2 sample;

increasing rapidly the high pressure applied to said PVF_2 sample to a second predetermined value in a predetermined short time interval;

cooling said sample in said high pressure cell; and reducing pressure applied to said sample to atmospheric pressure.

4,349,503

POLYESTER COMPOSITIONS CONTAINING SODIUM NITRITE

Shaul M. Aharoni, Morris Plains, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 15, 1981, Ser. No. 263,662
Int. Cl.[3] C08F *8/00*; C08L *67/02*
U.S. Cl. 264—328.16 28 Claims

24. A method of making a crystalline polyester composition comprising the steps of: melt blending polyester and sodium nitrite in a temperature range greater than the melting point of sodium nitrite, which is 271° C., and above the melting point of the polyester, and lower than about 325° C.; cooling the melt blend to below the temperature (Tcc) at which crystallization of the polyester in the blend begins; and nucleating the polyester crystals with the sodium nitrite.

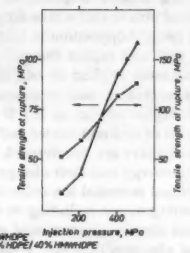
28. The method as recited in claim 24 further comprising the step of injection molding the melt blend in a mold water cooled to from 76.7° C. to 100° C., wherein the cooling and nucleating steps take place.

4,349,504

INJECTION MOULDING PROCESS USING POLYMER BLENDS CONTAINING HIGH MOLECULAR POLYETHYLENE OF HIGH DENSITY

Josef Kubat, Solparksvägen 3, S-171 35 Solna; Hans M. Rigdahl, Klostergangen 7, S-413 18 Gothenburg, and Jan K. Djurner, Viktoriagatan 8, S-411 25 Gothenburg, all of Sweden

PCT No. PCT/SE79/00210, § 371 Date Jun. 20, 1980, § 102(e) Date Jun. 12, 1980, PCT Pub. No. WO80/00813, PCT Pub. Date May 1, 1980
PCT Filed Oct. 19, 1979, Ser. No. 199,515
Claims priority, application Sweden, Oct. 20, 1978, 7810977
Int. Cl.[3] B29F *1/00*; B29B *1/00*
U.S. Cl. 264—328.17 8 Claims



1. A process for producing a fiber-reinforced injection molded article having improved mechanical strength, said process comprising injection molding a blend of:

(a) high density high molecular weight polyethylene, blended with

(b) a polymeric matrix material with which the polyethylene of (a) has a limited solubility such that the high molecular weight high density polyethylene forms a fiber phase in the matrix material,

at a molding pressure of more than 250 MPa thereby producing a fiber-reinforced injection molded article having improved mechanical properties.

4,349,505

NEUTRAL BEAMLINE WITH ION ENERGY RECOVERY BASED ON MAGNETIC BLOCKING OF ELECTRONS

William L. Stirling, Oak Ridge, Tenn., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jul. 1, 1980, Ser. No. 164,990
Int. Cl.[3] G21B *1/00*
U.S. Cl. 376—130 9 Claims

1. In a neutral beam injector system for generating and directing an energetic neutral particle beam along a beamline wherein said energetic neutral particle beam is derived from a beam of ions of a selected light isotopic species generated in a ground potential operated ion source and accelerated along said beamline through a neutralizer means wherein a significant portion of said ions are converted into energetic neutral particles together with electrons and residual energetic ions directed along said beamline exiting said neutralizer means, the combination of a system for direct recovery of the kinetic energy of said residual energetic ions comprising:

power supply means for applying an accelerating electrical potential to said neutralizer means to accelerate said ions from said ground potential operated ion source to a selected kinetic energy level along said beamline through said neutralizer means;

magnetic field generating means coupled with the beam exit region of said neutralizer means for producing a magnetic field (B) in said exit region transverse to said beam path of sufficient strength to block said electrons from said neutral beam path at said exit region and deflect said residual ions from said beam path;

an ion collector means for collecting the charge of said deflected residual ions exiting said neutralizer, said collector means including at least one ground potential ion charge collecting surface disposed in the path of said deflected residual ions so that a retarding electric field (E) is generated in parallel opposition to said beam exiting said neutralizer in said exit region thereof by virtue of said accelerating potential applied to said neutralizer, said E field being transverse to said magnetic field B in said neutralizer exit region so that an E x B field is generated in said exit region of said neutralizer and said residual ions exiting said neutralizer are decelerated, thereby recovering their kinetic energy and their charge collected on said at least one ground potential ion collector surface;

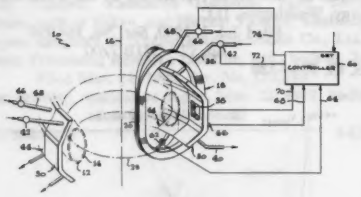
an electron collecting means including an electron collector surface disposed closely adjacent said exit region of said neutralizer and electrically biased slightly positive with respect to said neutralizer for collecting said electrons which drift in an E x B fashion in said exit region of said neutralizer into said electron collector surface upon exiting said neutralizer so that said electrons are terminated at a potential substantially removed from ground potential to prevent energy loss due to said electrons being accelerated into said ground potential ion collecting surface.

4,349,506

THERMOMAGNETIC BURN CONTROL FOR MAGNETIC FUSION REACTOR

John M. Rawls, Del Mar, and Unto A. Peuron, Solana Beach, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 1, 1980, Ser. No. 164,989
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—142 **8 Claims**



1. In a fusion reactor which includes a plurality of spaced field coils that each extend around a plasma region, to generate a magnetic field at the plasma region, the improvement of means for controlling magnetic field ripple comprising:

a magnetic shield structure formed of ferromagnetic material which has a temperature-dependent saturation magnetization, said structure lying between the plasma region and field coils;

means for controlling the temperature of said shield structure, to thereby cause the magnetic field ripple and therefore the heat loss from said plasma; and

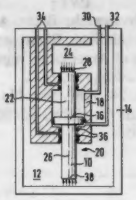
means responsive to the state of said plasma for operating said temperature controlling means.

4,349,507

DRIVE FOR AN ABSORBER ROD OF A NUCLEAR REACTOR

Josef Schoening, Hambruecken; Claus Elter, Bad Durkheim, and Hermann Schmitt, Langmeil, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH., Cologne, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,862
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 2927628
Int. Cl.³ G21C *7/16*
U.S. Cl. 376—230 **12 Claims**



6. A drive for an absorber rod of a nuclear reactor comprising:

a drive chamber mounted within the pressure vessel of a nuclear power plant,

a drive piston mounted within said drive chamber for movement along its longitudinal axis,

a hollow absorber rod fixedly attached at one end to said drive piston and extending outside said drive chamber to a terminating surface at its other end,

an equalizing surface fixedly attached to said drive piston, transverse to said longitudinal axis and facing the opposite direction of said terminating surface,

means for controlled movement of said drive piston within said drive chamber independent of the medium contained within the pressure vessel,

means for cooling said absorber rod with a cooling medium flowing within said hollow absorber rod,

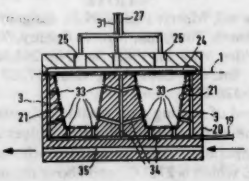
wherein said absorber rod terminating surface is exposed to the medium contained within the pressure vessel and said equalizing surface is exposed to said cooling medium.

4,349,508

METHOD FOR STERILIZING CONTAINERS

Dieter Liede, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 207,052
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029685
Int. Cl.³ A61L *2/04, 2/06*
U.S. Cl. 422—1 **2 Claims**



1. A method for sterilizing premolded packaging containers having interior and exterior walls, comprising subjecting the interior wall of the container to a heating medium while concurrently subjecting the exterior wall to a cooling medium by applying a force to the pre-molded containers to hold the exterior wall of the container in contact with a cooled body

having said cooling medium therein, said force being produced by subjecting the interior and exterior walls of the container to different pressures, the pressure exerted against the interior wall being greater than the pressure exerted against the exterior wall.

4,349,509

OXYGEN INDICATOR ADAPTED FOR PRINTING OR COATING AND OXYGEN-INDICATING DEVICE

Yoshio Yoshikawa; Takanari Nawata, both of Tokyo; Mikio Goto, Matsudo, and Yukio Kondo, Yono, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Jun. 27, 1980, Ser. No. 163,870

Claims priority, application Japan, Jul. 3, 1979, 54-84122

Int. Cl.³ G01N *31/22;* C09K *3/00*

U.S. Cl. 422—57 **21 Claims**

1. An oxygen indicator adapted for printing which comprises

(a) at least one reducing agent selected from the group consisting of mixtures of at least one alkaline substance and dithionites, ferrous compounds, reducing saccharides or mixtures thereof; ascorbic acid; erysorbic acid or a salt thereof; stannous salts; hydroxyamine; hydrazine; ketocarboxylic acids; sulfoxylates; alkali metal sulfides and boron hydrides;

(b) a dyestuff which has a color in an atmosphere containing oxygen and a different color in a non-oxygen containing atmosphere when it is reduced with said reducing agent;

(c) at least one thickening agent selected from the group consisting of sodium carboxymethyl cellulose, hydroxyethyl cellulose, methyl-cellulose, sodium alginate, polyvinyl alcohol, gum arabic powder, gum tragacanth, dextrin and casein in an amount of 0.05–10% by weight on the basis of (a), (b), (c) and (d); and

(d) at least one solvent selected from the group consisting of water, alcohols, and mixtures thereof.

2. A sheet-like oxygen indicator comprising a sheet selected from the group consisting of cellulosic sheets and plastic sheets and a composition coated or printed thereon which comprises

(a) at least one reducing agent selected from the group consisting of mixtures of at least one alkaline substance and dithionites, ferrous compounds, reducing saccharides or mixtures thereof; ascorbic acid; erysorbic acid or a salt thereof; stannous salts; hydroxyamine, hydrazine; ketocarboxylic acids; sulfoxylates; alkali metal sulfides and boron hydrides;

(b) a dyestuff which has a color in an atmosphere containing oxygen and a different color in a non-oxygen containing atmosphere when it is reduced with said reducing agent;

(c) at least one water soluble polymeric compound in an amount of 0.05 to 10% by weight on the basis of weight of the total composition selected from the group consisting of sodium carboxymethyl cellulose, hydroxyethyl cellulose, methyl cellulose, sodium alginate, polyvinyl alcohol, gum arabic powder, gum tragacanth, dextrin and casein; and

(d) at least one solvent selected from the group consisting of water, alcohols, and mixtures thereof.

4,349,510

METHOD AND APPARATUS FOR MEASUREMENT OF SAMPLES BY LUMINESCENCE

Seppo Kolehmainen, P.O. Box 2805, Titusville, Fla. 32780, and Veikko Tarkkanen, Krijgersberglaan 25, 6371 CA Schaesberg, Netherlands

Filed Jul. 23, 1980, Ser. No. 171,323

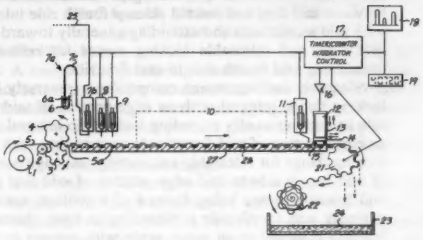
Claims priority, application United Kingdom, Jul. 24, 1979, 7925713

Int. Cl.³ G01N *33/52, 35/02*

U.S. Cl. 422—66 **21 Claims**

1. An apparatus for automatically measuring the bio-and chemi-luminescence in a plurality of samples, comprising:

means for making successive sample wells in a non-transparent, light-reflecting tape, means for transporting the tape along a path, means for delivering a measured volume of a liquid sample into each well at a first location along said path, means for dispensing a measured volume of at least one reagent into said liquid sample in each well in said tape in at least one further location along said path to generate luminescence, light-detector means adjacent said tape along said path and spaced from said dispensing means along said path and adapted to detect light generated in situ from the mixture of the liquid and said at least one reagent in each respective well, said detector means



generating a corresponding electrical signal, said detector means engaging the outer periphery of successive wells and provided with resilient means for forming a light tight seal between said detector means and said wells thereby excluding ambient light from entering said detector means during measurement of a sample, shutter means synchronized to exclude ambient light from said detector means during movement of said tape from one of said wells to the next. Means for processing said signal, and control means for synchronizing the operation of said transporting means, said delivering means, dispensing means, said light detector means, and said processing means.

4,349,511

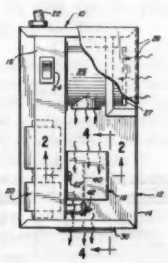
AIR PURIFICATION APPARATUS

Charles B. Owen, Mundelein, Ill., assignor to Environmental Electronics Corporation, Northbrook, Ill.

Filed Jul. 9, 1981, Ser. No. 281,703

Int. Cl.³ 361 *231;* C01B *13/12*

U.S. Cl. 422—186.07 **2 Claims**



1. An air purification apparatus comprising:

a plurality of electrode elements each comprising a flattened tubular spiral of metal wire mesh disposed in a side-by-side array,

dielectric means for effecting an insulating separation between adjacent electrode elements comprising a first set of dielectric plates separating adjacent ones of said electrode elements and a second set of dielectric plates perpendicular to said first set,

means for establishing an electric discharge between adjacent ones of said elements, and

unitary housing means for releasably retaining electrode elements in said side-by-side array and urging said electrode elements into contact with said first set of dielectric plates,

said housing means comprising a generally rectangular housing with open opposite ends within which said electrode elements are contained so that ends thereof face said open ends, said housing including first and second opposite sides, said second set of dielectric plates being respectively disposed between said electrode elements and said first and second sides, a third side integral with and extending between said first and second sides, a fourth side integral with said second side and extending generally toward said first side, and releasable locking means for releasably connecting said fourth side to said first side,

said releasable locking means comprising a reversely bent locking flange integral with an edge portion of said first side and an outwardly extending locking lip integral with an edge portion of said fourth side cooperating with said locking flange for releasably connecting said edge portion of said fourth side to said edge portion of said first side, said housing means being formed of a resilient material whereby said fourth side is biased to an open clearance position disposed at an acute angle with respect to said first side and away from said third side accommodating insertion of said electrode elements and said first and second sets of dielectric plates into said housing before said fourth side is releasably connected to said first side by insertion of said locking lip behind said locking flange and locating said fourth side in a closed position wherein said fourth side is disposed perpendicularly with respect to said first side, the resiliency of said housing means biasing said locking lip into engagement with said locking flange and said electrodes and dielectric means into engagement with one another and with said housing means.

4,349,512

NON-POLLUTING TREATMENT OF ALKALINE URANIFEROUS EFFLUENTS CONTAINING $SO_4^=$ IONS

Bernard Berger, Tassin La Demi Lune, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

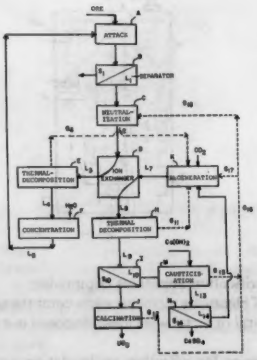
Filed Jan. 25, 1979, Ser. No. 6,332

Claims priority, application France, Feb. 8, 1978, 78 04192

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ C01G *43/01*

U.S. Cl. 423—7 **16 Claims**



1. A process for the recovery of uraniferous and sulphur values from liquor resulting from the attack of sulphur containing uraniferous ores by an alkaline solution of sodium carbonate and/or bicarbonate wherein the resulting liquor contains sodium carbonate and/or bicarbonate and sodium sulphate in addition to uranium values, the steps of

(1) introducing ammonia into the liquor whereby any HCO_3^- is converted to $CO_3^=$;

(2) contacting the neutralized liquor from step (1) with an anion exchange resin to fix the uranium and $SO_4^=$ ions, leaving a liquor containing ammonia, sodium carbonate and/or bicarbonate in solution;

(3) eluting the uranium and $SO_4^=$ ions fixed on the ion exchange resin with an ammonia carbonate and/or bicarbonate solution to yield a solution of ammonium uranyl carbonate complex and ammonium sulphate;

(4) subjecting the solution to thermal treatment until a suspension of precipitated ammonium uranate and/or diuranate is obtained in a solution of the ammonium sulphate while CO_2, NH_3 and H_2O are vaporized off;

(5) separating the precipitated ammonium uranate and/or diuranate from the solution of ammonium sulphate from step (4);

(6) calcining the separated ammonium uranate and/or diuranate to yield uranium oxide (UO_3) and NH_3 vapors.

4,349,513

PROCESS FOR RECOVERING URANIUM AND/OR THORIUM FROM A LIQUID CONTAINING URANIUM AND/OR THORIUM

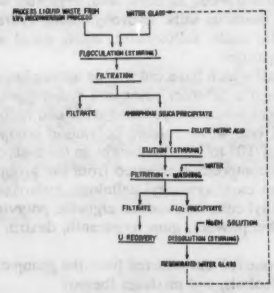
Shoji Ishiwata; Yasuo Kuroda, both of Omiya; Shoichi Tanaka, Musashino; Tsuneo Watanabe, and Shinichi Hasegawa, both of Ibaragi, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1980, Ser. No. 146,214

Claims priority, application Japan, Dec. 25, 1979, 54/169075

Int. Cl.³ C01G *56/00*; C01F *15/00*

U.S. Cl. 423—12 **1 Claim**



1. A process for recovering a metal selected from the group consisting of uranium, thorium and mixtures thereof, from a liquid containing said metal comprising the steps of adding water glass to said liquid in the presence of aqueous fluorine and ammonia water to cause a precipitate composed of an amorphous silica to be formed, whereby said metal is absorbed, filtering said precipitate therefrom, treating said filtered precipitate with acid to cause said absorbed metal to be eluted therefrom, filtering said precipitate to recover said eluted metal as an acidic filtrate therefrom, washing away anions of said metal remaining in said filtered precipitate with water, and dissolving said washed precipitate in an alkai metal hydroxide solution to regenerate said amorphous silica constituting said precipitate, to water glass.

4,349,514

PROCESS FOR RECOVERY OF REUSABLE CHROMIC ACID FROM THE WASTE CHROMIC ACID SOLUTION CONTAINING IMPURITIES

Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation, Osaka, Japan

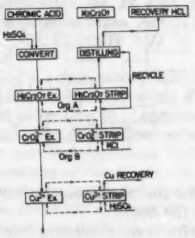
Continuation of Ser. No. 932,321, Aug. 9, 1978, abandoned, which is a continuation of Ser. No. 786,770, Apr. 12, 1977, Pat. No. 4,144,145. This application Aug. 13, 1979, Ser. No. 66,167

Claims priority, application Japan, Apr. 15, 1976, 51-41808; Jul. 29, 1976, 51-89674; Nov. 27, 1976, 51-142499; Dec. 6, 1976, 51-145688

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.³ B01D *11/00;* C01G *37/00, 37/14*

U.S. Cl. 423—54 10 Claims



1. A process for the recovery of hexavalent chromium values from an aqueous solution containing hexavalent chromium values and heavy metal ions comprising:

(a) adding H_2SO_4 to the solution in an amount at least stoichiometrically equivalent to the heavy metallic ions in the solution;

(b) extracting the hexavalent chromium values from the aqueous acidified solution by liquid-liquid extraction using an organic extractant (A) consisting essentially of one or more compounds selected from the group consisting of phosphoric acid esters together with a petroleum hydrocarbon as a diluent to produce an organic phase containing hexavalent chromium values and an aqueous raffinate;

(c) bringing the organic phase containing hexavalent chromium values into contact with water which is free from sodium, potassium, and ammonium to regenerate the organic extractant (A);

(d) extracting any remaining hexavalent chromium in said aqueous raffinate by liquid-liquid extraction with an organic extractant (B) consisting essentially of one or more compounds selected from the group consisting of primary, secondary, tertiary and quaternary amines together with a petroleum hydrocarbon as a diluent; and

(e) bringing the organic phase containing hexavalent chromium values into contact with a solution containing Na, K or NH_4 ion to regenerate the organic extractant (B) and recirculating the organic extractant (B) into step (a).

4,349,515

TUNGSTEN PRODUCTION FROM RAW MATERIALS CONTAINING PHOSPHORUS IMPURITIES

Wolfgang Müller, Bad Harzburg, Fed. Rep. of Germany, assignor to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 267,839

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023593

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—58 10 Claims

1. A method for producing tungsten compounds low in phosphorus, which comprises:

precipitating calcium tungstate from a tungstate solution containing phosphate impurities;

converting the calcium tungstate by a pressure leaching with an alkali carbonate so as to produce an aqueous tungstate solution and a residue containing calcium phosphate and calcium carbonate; and recovering an alkali tungstate solution low in phosphorous.

4,349,516

PROCESS FOR TREATING THE GAS STREAM FROM AN ALUMINUM VALUE CHLORINATION PROCESS

Wendell E. Dunn, Jr., Box 534, Spearfish Canyon, S. Dak. 57783

Filed Apr. 20, 1981, Ser. No. 255,549

Int. Cl.³ C01F *7/48, 7/62*

U.S. Cl. 423—111 1 Claim

1. A method for producing aluminum chloride suitable for direct introduction into an aluminum chloride reduction cell by treatment of the gas stream emerging from an aluminum value source chlorination process comprising the steps of:

1. reducing and condensing iron chloride in one or more iron chloride condensation stages;

2. absorbing the aluminum chloride contained in the gas stream under high temperature conditions with an alkali chloride or alkali chloride mixture in an at least 1/1 ratio to form an ionic aluminum chloride-alkali chloride complex; and

3. selectively condensing the chlorides from the product by step (2) to produce a purified aluminum chloride-alkali chloride complex suitable for direct introduction into an aluminum chloride reduction cell.

4,349,517

METHOD OF PRODUCING CUBIC BORON NITRIDE

Vladislav S. Lysanov, ulitsa Vyvilovykh, 8/1, kv. 422; Viktor V. Digonsky, prospekt Dobroljubova, 5, kv. 31; Leon I. Feldgun, ulitsa S. Kovalevskoi, 14/3, kv. 91; Valery M. Davidenko, ulitsa Marshala Govorova, 14, kv. 19, all of Leningrad; Nikolai V. Novikov, ulitsa A. Barbjusa, 22/26, kv. 125, Kiev; Alexandr I. Borimsky, Vyshgorodskaya ulitsa, 68/2, kv. 55, Kiev; Alexandr A. Shulzhenko, Novokonstantinovskaya ulitsa, 7, kv. 48, Kiev; Valerian D. Yakimenko, Polyarnaya ulitsa, 5-a, kv. 193, Kiev; Eduard Y. Dovgal, Drezdenskaya ulitsa 12, kv. 48, Leningrad; Vitaly Y. Egorov, ulitsa Komissara Smirnova, 15, kv. 89, Leningrad; Vyacheslav S. Rovsha, prospekt Shvernika, 14, kv. 193, Leningrad; Alexei I. Prikhna, Vyshgorodskaya ulitsa 76-a, kv. 39, and Alexandr N. Sokolov, Radomyshlenskaya ulitsa, 25, kv. 67, both of Kiev, all of U.S.S.R.

Filed Oct. 21, 1980, Ser. No. 199,273

Int. Cl.³ C01B *35/14*

U.S. Cl. 423—290 8 Claims

1. A method of producing cubic boron nitride comprising:

subjecting to a pressure of 40 to 70 kilobars and a temperature of 1100° to 2000° C. a charge comprising hexagonal boron nitride and a conversion initiator selected from the group consisting of an alkali metal, an alkaline earth metal and borides of the aforesaid metals;

doping the aforesaid charge with a hydrated salt containing an element selected from the group consisting of sulfur, halogen and nitrogen, said hydrated salt incorporating at least 5 molecules of water of hydration.

4,349,518

METHOD OF MAKING HIGH PURITY CALCIUM HYDROGEN PHOSPHATE DIHYDRATE

Robert A. Long, and Albert K. Fan, both of Bradford, Pa., assignors to GTE Products Corporation, Stamford, Conn.

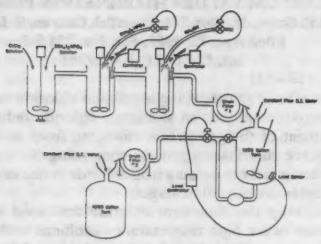
Filed Apr. 27, 1981, Ser. No. 257,821

Int. Cl.³ C01B *25/32*

U.S. Cl. 423—308 9 Claims

1. A method of making brushite by continuous process comprising: continuously introducing solutions containing calcium

ions and phosphate ions into a mixing container to form a slurry of brushite therein, the pH of the slurry in said mixing container being about 3.5–4.0; continuously introducing slurry from said mixing container into a second container to which metered amounts of ammonium phosphate are added tomaintain and control pH to a pH higher than that in said mixing container; continuously introducing slurry from said second container into a third container to which metered amounts of ammonium hydroxide are added to maintain and control pH at



a pH where brushite solubility is low; continuously introducing slurry from said third container to continuous filtering means where a filter cake is formed; continuously removing filter cake from said filtering means and reslurrying it in water for washing; continuously introducing the reslurry to a second continuous filtering means where a second filter cake is formed; and continuously removing said second filter cake from said second filtering means and again reslurrying it in wash water.

4,349,519

PURIFICATION OF WET PROCESS PHOSPHORIC ACID

Yoichi Hiraga, Shin-nanyo; Osamu Watanabe, and Masaki Nakatani, both of Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Company, Ltd., Shin-nanyo, Japan

Filed Dec. 9, 1980, Ser. No. 214,671

Claims priority, application Japan, Jan. 14, 1980, 55-2135

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 S **3 Claims**

1. A process for purifying wet-process H_3PO_4, comprising:

(a) introducing butanol and wet process H_3PO_4 having a P_2O_5 concentration of more than 35 wt percent into a multistage extraction battery wherein H_2SO_4 is added to the fifth or higher stage from the discharge of the extracted solution and at second or higher stage from the raffinate discharge, the amount of said H_2SO_4 being in a gram equivalent ratio given by subtracting the amount of H_2SO_4 present in said wet process H_3PO_4 from 1.2 to 2.0 times the sum of total cation impurities present in said wet process H_3PO_4 and the total amount of alkali metal or magnesium cations added during purification step;

(b) introducing said extracted solution having H_3PO_4 concentration of about 130 to about 180 g/liter into a multistage purification battery wherein cation selected from the group consisting of Na^+, K^+, $Mg^{++}$and mixtures thereof is added at second or higher stage from the stage of discharging the solvent phase and second or higher stage from the discharge of aqueous phase, the concentration of said cation in said aqueous phase being more than about 0.4g equivalent per liter; and

(c) introducing purified solvent extract obtained from step (b) into a stripping battery and recovering purified H_3PO_4.

4,349,520

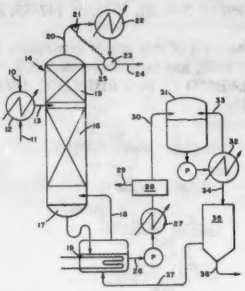
CONTINUOUS HYDROLYSIS OF KETOXIME

John H. Bonfield, Basking Ridge; Stylianos Sifniades, Madison, and Harry E. Ulmer, Morris Township, Morris County, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 24, 1981, Ser. No. 295,347

Int. Cl.³ C01B *21/14*

U.S. Cl. 423—387 **13 Claims**



1. A process for the continuous hydrolysis of a ketoxime which comprises the steps:

(a) feeding to a fractional distillation column at an intermediate feed point a feed mixture comprising an aliphatic or cycloaliphatic ketoxime of 3–8 carbons and an inorganic acid which is not strongly oxidizing;

(b) feeding steam to the column adjacent the base of said column;

(c) operating said column with sufficient steam feed, sufficient effective plates between said feed point and the base of said column and sufficient reflux to hydrolyze said ketoxime in said column and form the ketone corresponding to said ketoxime and the hydroxylammonium salt of said inorganic acid;

(d) recovering an overhead comprising said ketone; and

(e) recovering as bottoms an aqueous solution comprising said hydroxylammonium salt.

4,349,521

RUTHENIUM CARBONYLATES, RUTHENIUM CARBONYL HYDRIDES, OSMIUM CARBONYLATES AND THEIR PREPARATION

Sheldon G. Shore, Columbus, Ohio, and Colleen C. Nagel, St. Paul, Minn., assignors to The Ohio State University Research Foundation, Ohio

Continuation-in-part of Ser. No. 127,214, Mar. 4, 1980, abandoned. This application Jun. 16, 1981, Ser. No. 274,152

Int. Cl.³ C01G *1/04, 55/00*; C07F *15/00*

U.S. Cl. 423—417 **118 Claims**

1. A ruthenium carbonylate anion of the formula $[H_xRu_4(CO)_{13}]^{(2-x)-}$ where x is 0 or 1.

4,349,522

IRON, NICKEL AND COBALT TRI-OSMIUM CARBONYL HYDRIDES AND THEIR PREPARATION

Sheldon G. Shore, Columbus, Ohio, and Jeffrey S. Plotkin, Heightstown, N.J., assignors to The Ohio State University Research Foundation, Ohio

Continuation-in-part of Ser. No. 150,228, May 15, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 275,693

Int. Cl.³ C01G *49/16, 55/00*; C07F *15/00*

U.S. Cl. 423—417 **63 Claims**

1. A method for making a tri-osmium heteronuclear metal carbonyl compound, which comprises:

(a) establishing a reaction mixture comprising an electron

deficient cobalt, nickel or iron carbonyl or carbonyl anion, $H_2Os_3(CO)_{10}$, and a solvent which at least partially solubilizes at least one of said electron deficient carbonyl compound and said $H_2Os_3(CO)_{10}$, said $H_2Os_3(CO)_{10}$ reacting with said electron deficient carbonyl compound as a Lewis base; and

(b) recovering said tri-osmium heteronuclear metal carbonyl compound from said reaction mixture.

4,349,523

PROCESS FOR PRODUCING CARBON FIBER OF IMPROVED OXIDATION RESISTANCE

Toru Hiramatsu; Teruo Koseki, both of Ehime; Satosi Hamada, Matsuyama, and Atsushi Sumida, Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 83,801, Oct. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 893,683, Apr. 5, 1978, abandoned. This application Jan. 29, 1981, Ser. No. 229,747
Claims priority, application Japan, Apr. 5, 1977, 52-38142
Int. Cl.³ D01F 9/22
U.S. Cl. 423—447.4 **2 Claims**

1. An improvement in a process for producing a carbon fiber of enhanced oxidation resistance, having a specific volume resistance of at least about 1.2×10^{-3} ohm.cm, and containing, based on the weight of the carbon fiber, at least about 2% by weight of nitrogen and less than about 0.03% by weight of total impurities consisting of Na, K, Fe, Cu, Ni, Co, Cr, Mn and S, wherein a precursor acrylic polymer fiber is heated at a temperature of from about 200° to about 350° C. in an oxidizing atmosphere, thereby to be oxidized, and then, the oxidized fiber is heated to a temperature of from about 700° to about 1,600° C. in a non-oxidizing atmosphere, thereby to be carbonized;

said improvement comprising using as the precursor fiber an acrylonitrile copolymer fiber, which copolymer is comprised of at least 95% by mole of units derived from acrylonitrile and not more than 5% by mole of units derived from a carboxyl group-containing copolymerizable monoethylenically unsaturated monomer or monomers; the hydrogen atom of at least one carboxyl group contained in each of the units derived from the carboxyl group-containing monomer or monomers being replaced with a cation selected from the group consisting of:

$$R\text{—}N^{\oplus}\text{—}R \quad \text{and} \quad RNHN^{\oplus}H_3,$$
$$\quad\quad R$$

wherein R is selected from a hydrogen atom, alkyl groups having 1 to 3 carbon atoms and a phenyl group; said replacement being to such an extent that the units having the introduced cation occupy from 0.1% to 5% by mole, based on the copolymer, and, which copolymer contains less than about 0.05% by weight, based on the weight of the copolymer, of total impurities consisting of Na, K, Fe, Cu, Ni, Co, Cr, Mn and S; and said acrylonitrile copolymer fiber being produced by the steps of:

preparing a spinning dope of the acrylonitrile copolymer in an organic solvent, and;

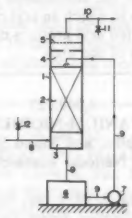
extruding the spinning dope into an aqueous coagulating bath to form a fiber, followed by treating the fiber by using an aqueous drawing bath, an aqueous washing bath and an aqueous oiling bath, all of the aqueous baths being prepared from water selected from deionized water and distilled water, and the aqueous oiling bath being prepared by using a cationic or nonionic oiling agent; each of the spinning dope, the aqueous coagulating bath, the aqueous drawing bath and the aqueous washing bath containing not more than 0.0005% by weight, based on the weight of the respective dope or bath, of total metal impurities consisting of Na, K, Fe, Cu, Ni, Co, Cr and Mn, and the aqueous oiling bath containing not more than 0.1% by weight, based on the weight of the aqueous oiling bath, of total impurities consisting of Na, K, Fe, Cu, Ni, Co, Cr, Mn and S.

4,349,524

PROCESS FOR PRODUCING PURIFIED HYDROCHLORIC ACID

Yoshisato Yamashita, and Yutaka Matsuo, both of Minamata-shi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 21, 1981, Ser. No. 256,242
Claims priority, application Japan, Feb. 20, 1980, 55-19928
Int. Cl.³ C01B 7/07
U.S. Cl. 423—488 **4 Claims**



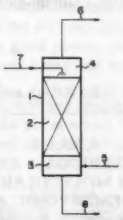
1. A process for producing purified hydrochloric acid which comprises washing hydrogen chloride gas which is generated by reacting an alkali chloride with sulfuric acid, with hydrochloric acid having a saturation concentration, to remove sulfuric acid, alkali sulfates and iron matter contained in the gas, and then having the resulting gas absorbed in water.

4,349,525

PROCESS FOR PURIFYING HYDROCHLORIC ACID PRODUCED FROM ALKALI CHLORIDE AND SULFURIC ACID

Yoshisato Yamashita, and Yutaka Matsuo, both of Minamata-shi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Apr. 21, 1981, Ser. No. 256,241
Int. Cl.³ C01B 7/07
U.S. Cl. 423—488 **5 Claims**



1. A process for purifying a conversion process-hydrochloric acid which comprises treating hydrochloric acid having a concentration of 20 to 35% by weight and obtained by causing hydrogen chloride gas generated by reacting an alkali chloride with sulfuric acid to be absorbed in water with an inert gas or a mixed gas of inert gas with oxygen to remove SO_2 and Br_2 contained in the said hydrochloric acid.

4,349,526

PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE

Gustaaf Goor, Hanau, and Wolfgang Kunkel, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 14, 1981, Ser. No. 283,194

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027253

Int. Cl.³ C01B *15/02*

U.S. Cl. 423—588 13 Claims

1. In a process for the production of hydrogen peroxide by the anthraquinone process including the reduction in a solvent of substituted anthraquinone as the reaction carrier, subsequent oxidation thereof, removal of the hydrogen peroxide formed and return of the rejuvenated reaction and wherein the solvent comprises a tetrasubstituted urea carrier to the reduction step the improvement comprising employing as at least a portion of the solvent for the reaction carrier a tetrasubstituted urea in which at least one of the substituents is an aryl group or a substituted aryl group in which an aryl ring carbon atom of the aryl group or substituted aryl group is directly attached to one of the nitrogen atoms of the urea.

4,349,527

IRON-TITANIUM-NIOBIUM ALLOY

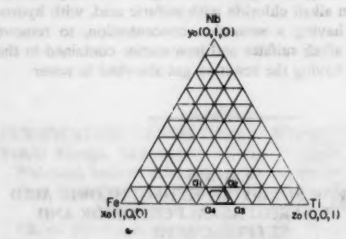
Muneyuki Amano, Chiba, and Yasuo Sasaki, Tokyo, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Sep. 5, 1979, Ser. No. 72,643

Claims priority, application Japan, Jan. 29, 1979, 54/8195

Int. Cl.³ C22C *38/12;* C01B *6/24*

U.S. Cl. 423—644 6 Claims



1. An iron-titanium-niobium alloy of the following formula

$$Fe_xNb_yTi_z$$

wherein $x+y+z=1$, $0.50 \geqq x \geqq 0.40$, and $0.10 \geqq y \geqq 0.005$.

4. A hydride of an iron-titanium-niobium alloy having the formula following

$$Fe_xNb_yTi_z$$

wherein $x+y+z=1$, $0.50 \geqq x \geqq 0.40$, and $0.10 \geqq y \geqq 0.005$.

4,349,528

MONOCOLONAL HYBRIDOMA ANTIBODY SPECIFIC FOR HIGH MOLECULAR WEIGHT CARCINOEMBRYONIC ANTIGEN

Hilary Koprowski, Wynnewood; Kenneth F. Mitchell, Unionville, and Zenon Steplewski, Strafford, all of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 21, 1979, Ser. No. 96,309

Int. Cl.³ G01N *56/00;* G01T *1/00*

U.S. Cl. 424—1 4 Claims

1. A diagnostic method for detecting the presence of colorectal carcinoma which comprises contracting blood serum with a monoclonal antibody having a specificity for 180,000 dalton molecular weight carcinoembryonic antigen and which corresponds to the antibody produced by hybrid cell ATCC #CRL-8019, and measuring materials bound by the antibody.

4,349,529

DIAGNOSTIC AND THERAPEUTIC CAPSULES AND METHOD OF PRODUCING

Nabil A. Morcos, South Brunswick; Thomas A. Haney, East Brunswick, and Paul W. Wedeking, Cranbury, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 14, 1980, Ser. No. 140,341

Int. Cl.³ A61K *43/00, 49/00;* G01T *1/00*

U.S. Cl. 424—1 10 Claims

1. An article of manufacture comprising, a pharmaceutical capsule formed essentially of a nontoxic, water soluble material adapted to being ingested and rapidly disintegrating on contact with fluids of the gastro-intestinal tract and a polyethylene glycol filler material having a pharmaceutically useful radioactive iodine and a reducing agent dispersed therein, said capsule having a central axis and an inner surface, said inner surface defining a volume within said capsule, said filler material being supported by said inner surface of said capsule,

a major portion of said volume within said capsule containing said filler material, said filler material having a shape which is coextensive with the inner surface of said capsule, said filler material extending radially across the central axis of said capsule, said filler material containing a major portion of said radioactive iodine within the interior of said filler material, whereby said major portion of said radioactive compound does not contact said inner surface of said capsule.

4,349,530

IMPLANTS, MICROBEADS, MICROCAPSULES, PREPARATION THEREOF AND METHOD OF ADMINISTERING A BIOLOGICALLY-ACTIVE SUBSTANCE TO AN ANIMAL

Garfield P. Royer, Worthington, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed Dec. 11, 1980, Ser. No. 215,426

Int. Cl.³ B01J *13/02;* A61K *9/50*

U.S. Cl. 424—19 77 Claims

1. A method of incorporating a non-albumin substance in a matrix of cross-linked but physically-native albumin, which method comprises:

forming a solution of a native albumin;

dispersing said substance and a bi-functional cross-linking agent in said albumin solution, said cross-linking agent having the property of cross-linking but not physically denaturing albumin when said solution is maintained at a temperature not in excess of about 37° C. and a pH in the range of about 4 to about 10, thereby forming a single phase containing both said albumin and said cross-linking agent; and

thereafter maintaining said solution at a temperature not in excess of about 37° C. and at a pH in the range of about 4 to about 10 until at least one body of cross-linked but physically native albumin containing said substance forms in said solution.

4,349,531
NOVEL DOSAGE FORM

Arthur R. Mlodozeniec, and Arthur H. Goldberg, both of Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 886,967, Mar. 15, 1978, abandoned, and a continuation-in-part of Ser. No. 784,006, Apr. 4, 1977, abandoned, which is a division of Ser. No. 640,612, Dec. 15, 1975, Pat. No. 4,029,758. This application Oct. 4, 1979, Ser. No. 81,759

Int. Cl.³ A61K *9/24, 9/70*

U.S. Cl. 424—27 3 Claims

1. A solid pharmaceutical unit dosage form comprising a laminate composed of a plurality of layers of an edible, therapeutically inert web, at lest two of said layers having a composition comprising one or more medicaments loaded to one or more surfaces in a finely particulate form, said layers of web being arranged in said laminate so that substantially no medicament is loaded to an outer surface thereof, said laminate being sealed only at the contiguous edges so as to completely internalize said medicament, and wherein at least two layers in said laminate consist of a heat sealable polymeric composition comprising an organic film-forming ingredient and a plasticizer therefor and at least one layer in said laminate consists of a paper composition comprising one or more fibrous materials and at least one non-fibrous modifier therefor, the top and bottom layers of said laminate being polymeric with the proviso that there be no more than six of said paper composition webs interspersed between each pair of said polymeric layers.

4,349,532
COSMETIC COMPOSITIONS BASED ON POLY-(QUATERNARY AMMONIUM) POLYMERS

Guy Vanlerberghe, 40 Rue du General de Gaulle, Villevaude 77410 Claye Souilly; Henri Sebag, 26 Rue Erlanger, 75016 Paris, and Alexandre Zysman, 6, Rue George Eastman, 75013 Paris, all of France

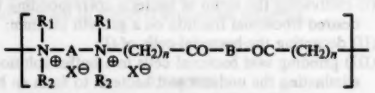
Filed Sep. 14, 1978, Ser. No. 942,319

Claims priority, application Luxembourg, Sep. 20, 1977, 78153

Int. Cl.³ A61K *7/06, 7/09, 7/11, 7/13*

U.S. Cl. 424—47 51 Claims

1. A cosmetic composition suitable for treating hair comprising from about 0.1 to 10% by weight of at least one poly-(quaternary ammonium) polymer having units of the formula:



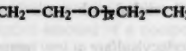
(I)

in which:

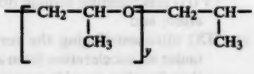
A denotes a linear or branched radical selected from the group consisting of alkylene, hydroxyalkylene, alkenylene and alkynylene having from 2 to 10 carbon atoms;

B denotes a radical selected from the group consisting of:

(a) a glycol radical of the formula —O—Z—O— in which Z denotes a linear or branched hydrocarbon radical having from 2 to 10 carbon atoms or a group of the formula:

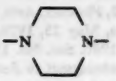


or



in which each of x and y denote a number of from 1 to 4;

(b) a bis-secondary diamine radical having the formula



(c) a bis-primary diamine radical of the formula:

—NH—Y—NH—

in which Y denotes a linear or branched hydrocarbon radical having from 2 to 10 carbon atoms or —CH_2—CH_2—S—S—CH_2—CH_2—; and

(d) a ureylene radical of the formula —NH—CO—NH—;

R_1 denotes an alkyl radical containing from 1 to 4 carbon atoms;

R_2 denotes a linear or branched hydrocarbon radical containing from 1 to 12 carbon atoms;

X^{β} denotes a halide ion and n denotes 1 or an integer from 3 to 10; and which further comprises at least one cosmetically acceptable adjuvant and a cosmetically acceptable carrier.

4,349,533
TOOTHPASTE CONTAINING PH-ADJUSTED ZEOLITE

Anthony L. Dent, Bala Cynwyd, Pa.; Elliot P. Hertzenberg, Wilmington, Del., and Howard S. Sherry, Cherry Hill, N.J., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 68,129, Aug. 20, 1979, abandoned. This application Dec. 18, 1980, Ser. No. 217,602

Int. Cl.³ A61K *7/16, 7/18, 7/28*

U.S. Cl. 424—52 5 Claims

1. A dentifrice formulation having a pH range outside the 4.2 to 5.4 demineralization threshold and which is acceptable psychosensorily to persons who will use it; said dentifrice being a toothpaste containing 5–80% by weight pH-modified zeolite and being free from zeolites that are not pH-modified;

said pH-modified zeolite being the result of slurrying a zeolite and slowly adding acid solution until the pH of the solution is 5.5–6.0, and therefore personally acceptable, said non-pH-modified zeolites not having personal acceptance;

said pH-modified zeolite having a slurry pH of 5.5–6.0 without the significant reduction of the crystal structure that would be caused by more severe treatment at pH 4 or less;

said pH-modified zeolite having a particle size of 0.5 to 3.5 μm and about an order of magnitude smaller than commercially acceptable abrasive agents that exhibit the same or less abrasion;

said acid slurried pH-modified zeolite not being crushed or fragmented or use but still providing polishing and lustering and providing good pasting properties to said toothpaste, said toothpaste being free from other abrasives and lustering agents;

said acid slurried pH-modified zeolite imparting a pH of 6 or above but below the pH at which there is personal objection to the taste and sense of dehydration to the mouth.

4,349,534
DENTIFRICE COMPOSITION

Edward Eigen, East Brunswick, and Dina I. Brachman, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,871

Int. Cl.³ A61K *7/16, 7/18, 7/26*

U.S. Cl. 424—52 10 Claims

1. A dentifrice comprising, as the essential dental abrasive, ground rice hull particles which pass a 200 mesh sieve size, the total amount of abrasive constituting less than 40% by weight of the composition.

4,349,535

LIQUID BASE MAKEUP COMPOSITION

Lawrence J. Liff, 6502 N. Central #A-101, Phoenix, Ariz. 85012

Continuation-in-part of Ser. No. 909,576, May 25, 1978, Pat. No. 4,183,898. This application Jan. 11, 1980, Ser. No. 111,354
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.[3] A61K *7/021;* A63J *3/00*
U.S. Cl. 424—63 1 Claim

1. A liquid base formulation for multiple makeup uses consisting of about 96.48% water; 2.0% cellulose; 1.34% chlorine dioxide; 0 to 0.15% ethylparaben and propylparaben; and 0 to 0.03% phosphoric acid to reduce and maintain the pH of the formulation in the range of about 5.0 to 6.0 in the event the pH is above the range of 5.0 to 6.0.

4,349,536

METHOD OF PROMOTING SUNTAN USING A CREAM CONTAINING ZINC AND COPPER SALTS

Kenneth J. Hausler, 401 Alderley St., Toowoomba, Queensland 4350, Australia

Continuation of Ser. No. 129,290, Mar. 11, 1980, abandoned, which is a continuation of Ser. No. 16,574, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 886,194, Apr. 18, 1978, abandoned. This application Apr. 20, 1981, Ser. No. 255,940
Int. Cl.[3] A61K *7/42, 33/30, 33/34*
U.S. Cl. 424—59 4 Claims

1. A method for promoting sun tan comprising topical administration to areas of skin exposed to ultraviolet radiation of an effective amount of a composition for selectivity transporting zinc (II) and copper (II) cations across the membranes of human epidermis and dermis, said composition consisting essentially of 0.1 to 1.0% by weight of each of zinc (II) sulfate and copper (II) sulfate in an oil-in-water cream base containing between about 0.5% and 2% by weight, based upon the total weight of said composition, of at least one topically acceptable anionic surfactant selected from the group consisting of alkali metal and magnesium salts of sulfuric acid esters of C_{10} to C_{14} fatty acid alcohols.

4,349,537

PERMANENT WAVE NEUTRALIZER

Arthur W. Forbriger, Jr., Cincinnati, Ohio, assignor to Tressa, Inc., Cincinnati, Ohio

Filed Mar. 20, 1981, Ser. No. 245,959
Int. Cl.[3] A61K *7/09, 7/11*
U.S. Cl. 424—71 5 Claims

1. A permanent waving neutralizer and oxidizing solution consisting essentially of an aqueous solution containing at least 0.2 molar citrate ion and having a sufficient amount of citric acid to provide a pH of about 1.9 to 4, and an oxidizing agent.

4,349,538

NUCLEASE-RESISTANT HYDROPHILIC COMPLEX OF POLYRIBOINOSINIC-POLYRIBOCYTIDYLIC ACID

Hilton B. Levy, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 101,074, Dec. 7, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 208,029
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.[3] A61K *45/02, 37/02;* C07C *103/52*
U.S. Cl. 424—85 19 Claims

1. A nuclease-resistant hydrophilic complex of: relatively high molecular weight polyriboinosinic-polyribocytidylic acid; relatively low molecular weight poly-l-lysine in a range of from about 13,000 daltons to about 35,000 daltons; and carboxymethylcellulose.

5. An injectable preparation in a pharmaceutically acceptable carrier of the complex of claim 1 whose unit dosage is sufficient to induce the synthesis of interferon in a mammal into which it is to be injected.

11. A method of inducing the synthesis of interferon in a primate which comprises administering to a primate host a nuclease-resistant hydrophilic complex of relatively high molecular weight polyriboinosinic-polyribocytidylic acid, relatively low molecular weight poly-l-lysine in a range of from about 13,000 daltons to about 35,000 daltons, and carboxymethylcellulose, in a dose sufficient to provide an interferon-inducing amount of said polyriboinosinic-polyribocytidylic acid.

4,349,539

SEPARATION OF HEPATITIS B SURFACE ANTIGEN

D. Eugene Wampler, Harleysville, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 15, 1980, Ser. No. 178,340
Int. Cl.[3] A61K *39/12, 39/29*
U.S. Cl. 424—89 7 Claims

1. In a method of separating HBsAg from a fluid containing HBsAg, the improvement which comprises centrifuging the fluid to collect a precipitate containing HBsAg, forming a suspension of the precipitate and concentrating the fluid by ultrafiltration to a volume not more than about 1/5 the initial volume.

4,349,540

PROCESS FOR PREPARING VACCINES BASED ON ANTIGENIC RIBOSOMAL FRACTIONS

Lucien D. D'Hinterland, Castres; Hubert Serre, Mazamet, and Gerard Normier, Castres, all of France, assignors to Pierre Fabre S.A., France

Continuation of Ser. No. 36,125, May 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 776,035, Mar. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 531,011, Dec. 9, 1974, abandoned. This application Jan. 26, 1981, Ser. No. 228,823
Claims priority, application France, Dec. 10, 1973, 73 43957
Int. Cl.[3] A61K *39/102, 39/09, 39/02*
U.S. Cl. 424—92 5 Claims

1. A process for the preparation of an acellular vaccine comprising (1) at least one ribosome extracted from pathogenic bacteria against which protection is desired, said ribosome functioning as an antigenic material and (2) peptidoglycans extracted only from the cell membranes of at least one of the bacteria used in (1), said process comprising

(a) extracting ribosomes from said bacteria by

(I) cultivating the strain of bacteria corresponding to the desired ribosomal fraction on a growth medium;

(II) decanting the bacterial cells of (I);

(III) grinding said bacterial cells in a buffer solution and eliminating the undestroyed bacteria to form an homogeneous cell macerate;

(IV) ultracentrifuging the homogeneous macerate of said bacteria under an acceleration from about 2×10^4 to 6×10^4 g to form (i) a supernatant phase containing the ribosomes on which impurities of the protein-type are absorbed and (ii) a residue containing all other components;

(V) separating and supernatant phase from said residue;

(VI) ultracentrifuging the separated supernatant phase under an acceleration from about 10^5 to about 2×10^5 g to form a centrifuged residue;

(VII) treating said centrifuged residue with a solution of sodium dodecylsulfate;

(VIII) precipitating sodium dodecylsulfate at low temperature; and

(IX) ultracentrifuging the resulting supernatant solution under an acceleration from about 10^5 to about 2×10^5 g, thus forming a residue containing purified ribosomes;

(b) forming peptidoglycans from the cell membranes of said bacteria by

(I) treating the residue of step (a) (IV) (ii) with a saline solution

(II) centrifuging the resulting saline solution-residue mixture to extract the bacterial cell membranes;

(III) digesting the extracted membranes with a proteolytic enzyme to separate membranal glycopeptides, and (IV) centrifuging the membranal glycopeptides, and

(c) mixing the purified ribosomes of (a) (IX) and the membranal glycopeptides of (b) (IV).

4,349,541

ANTI-TUMOR PREPARATION AGAINST CERTAIN TUMORS AND PROCESS FOR PREPARING THE SAME

Yasuhisa Takeda, Yokohama; Takashi Matsuno, Omiya; Mihoko Ohtaka, Tokyo; Hiroki Mitsui, Iruma; Tsutomu Kawaguchi, both of Tsurugashimamachi; Hisako Masuda, Tokyo; Hiroshi Okazaki, Sayama; Mitsuaki Handa, Kamifukuoka; Yutaka Sugawara, Omiya, and Haruki Ogawa, Chofu, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1979, Ser. No. 42,419

Claims priority, application Japan, May 29, 1978, 53-63418

Int. Cl.³ A61K *37/00, 35/74*

U.S. Cl. 424—95 **3 Claims**

1. A preparation effective against tumors such as MH 134, BAMC 1, Ehrlich tumor, and Meth A tumor, comprising a pharmaceutically acceptable carrier containing killed cells of *Streptococcus equisimilis* ATCC 21597 in an effective amount.

4,349,542

MIXTURE CONTAINING ACTIVE INGREDIENT AND DENDRITIC CRYSTALLINE SUGAR FOR TABLETING

John N. Staniforth, Birmingham, England, assignor to National Research Development Corporation, London, England

Filed May 5, 1980, Ser. No. 156,783

Claims priority, application United Kingdom, Jun. 8, 1979, 7920125

Int. Cl.³ C13K *5/00, 11/00, 13/00*

U.S. Cl. 424—153 **22 Claims**

1. A process for preparing a tablet comprising an active ingredient and an excipient, said process comprising mixing an active ingredient and an excipient comprising particles of a dendritic crystalline sugar, said particles being of average particle size in a range from 50–1000 μm in diameter and having surface pores of at least 10 μm in diameter, and subjecting said mixture to direct compression tableting.

4,349,543

HISTOLYTIC AGENTS AND THEIR USE

Haireddin Jacobi, Leichlingen; Wolfgang Opitz, and Eugen Etschenberg, both of Cologne, all of Fed. Rep. of Germany, assignors to Tropanwerke GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,315

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901667

Int. Cl.³ A61K *37/02, 37/00*

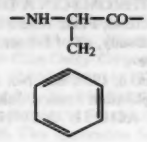
U.S. Cl. 424—177 **3 Claims**

1. A method of treating tissues in a warm-blooded animal which comprises administering to said animal a histolytically effective amount of a compound which is a dipeptide of the formula

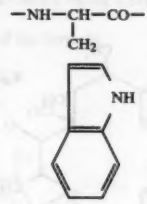
R—Phe—Trp—R_1 (I)

an acid addition salt or a base addition salt thereof or a stereoisomer thereof, in which

Phe denotes the radical



Trp denotes the radical



R denotes a hydrogen atom or a C_1 to C_6 alkanoyl group optionally substituted by a hydroxyl group or one or more halogen atoms and

R_1 denotes a hydroxyl, C_1 to C_4 alkoxy, amino, C_1 to C_4 alkylamino or di-C_1 to C_4 alkylamino group either alone or in admixture with a diluent or in the form of a medicament.

4,349,544

METHOD FOR INCREASING THE MILK LET DOWN IN MAMMALS

Joseph H. Cort, Prague; Tomislav Barth, Roztoky u Praha; Karel Jost, Prague, and Zdenek Vezník, Brno, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

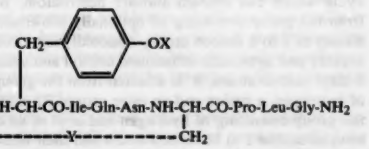
Continuation-in-part of Ser. No. 31,062, Apr. 18, 1979, Pat. No. 4,237,119, which is a continuation-in-part of Ser. No. 931,134, Aug. 4, 1978, abandoned, which is a continuation of Ser. No. 813,665, Jul. 7, 1977, abandoned. This application Nov. 12, 1980, Ser. No. 205,951

Claims priority, application Czechoslovakia, Jul. 16, 1976, 4690-76

Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **4 Claims**

1. A method for increasing the milk let down in mammals which comprises administering an effective amount of a compound of the formula



where X is H or CH_3 and Y is CH_2S or SCH_2.

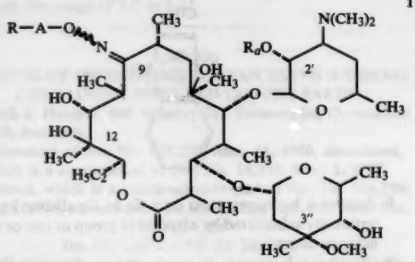
4,349,545
NOVEL ERYTHROMYCIN A DERIVATIVES

Solange Gouin d'Ambrieres, Paris; Andre Lutz, Strasbourg, and Jean-Claude Gasc, Bondy, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jan. 8, 1981, Ser. No. 223,368
Claims priority, application France, Jan. 11, 1980, 80 00566
Int. Cl.[3] A61K *31/70;* C07H *17/08*
U.S. Cl. 424—180 18 Claims

1. An erythromycin compound selected from the group consisting of a compound in the syn form or antiform or mixtures of the syn and anti forms of the formula

I



wherein A is a linear or branched alkylene of 1 to 6 carbon atoms, R is selected from the group consisting of optionally substituted alkoxy of 1 to 6 carbon atoms, optionally substituted alkenyloxy and alkynyloxy of 2 to 6 carbon atoms, optionally substituted alkylthio of 1 to 6 carbon atoms, optionally substituted alkenylthioand alkynyllthio of 2 to 6 carbon atoms with the thio groups optionally oxidized to the sulfoxide or sulfone form, optionally substituted aryloxy and arylthio, optionally substituted aralkyloxy and arylalkylthio of 1 to 6 alkyl carbon atoms the thio derivatives optionally oxidized to sulfoxide or sulfone

optionally substituted quaternary ammonium group, halogen, optionally substituted 1,2-epoxyethyl and the group resulting from opening of the epoxy with a nucleophilic reactant,

a free or protected formyl, —COOR', thiocyanate, —CN, acyl and carbamoy, the said optional substitutents on the R groups being at least one member of the group consisting of halogen and alkoxy and alkylthio of 1 to 6 carbon atoms R_1 and R_2 are individually selected from the group consisting of hydrogen and optionally substituted alkyl of 1 to 6 carbon atoms or taken together with the nitrogen atom to which they are attached form an optionally substituted, optionally unsaturated heterocycle which can contain another heteroatom, B is selected from the group consisting of optionally substituted alkyl and alkoxy of 1 to 6 carbon atoms, optionally substituted aryl and aryloxy and optionally substituted aralkyl and aralkoxy of 1 to 6 alkyl carbon atoms, R' is selected from the group consisting of hydrogen, a cation and an ester group, R_a is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

7. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

13. A method of combatting bacterial infections in warm-blooded animals comprising administering to warm-blooded animals an antibacterically effective amount of at least one compound of claim 1.

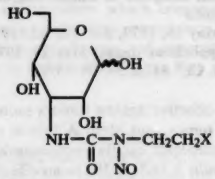
4,349,546
D-ALLOSE DERIVATIVE AND PREPARATION METHOD THEREFOR

Masahide Yamada, Yokohama; Kenichi Edanami, Kamakura, and Toshio Kuroda, Sagamihara, all of Japan, assignors to Wakamoto Pharmaceutical Co., Ltd., Nihonbashimuro, Japan

Filed Mar. 20, 1981, Ser. No. 245,920
Claims priority, application Japan, Mar. 24, 1980, 55-36200
Int. Cl.[3] A61K *31/70;* C08B *37/00*
U.S. Cl. 424—180 4 Claims

1. New D-allose derivatives of formula (I):

(I)



wherein X represents a halogen atom.

4,349,547
SUPPRESSING OBESITY AND OVER-SECRETION OF INSULIN WITH 2-(α-HYDROXY-M-TRIFLUOROMETHYLBENZYL-)AZETIDINE

Kanji Meguro, Hyogo; Hiroyuki Tawada, Osaka, and Takao Matsuo, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 18, 1980, Ser. No. 178,951
Claims priority, application Japan, Aug. 24, 1979, 54/108329
Int. Cl.[3] A61K *31/395;* C07D *205/04*
U.S. Cl. 424—244 4 Claims

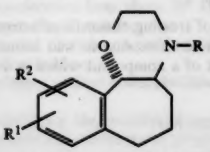
1. A method for producing antiobesity action in a mammal, which comprises administering to the mammal an effective amount of 2-(α-hydroxy-m-trifluoromethylbenzyl)azetidine or a physiologically acceptable acid addition salt thereof.

4,349,548
OCTAHYDROBENZO[6,7]CYCLOHEPT[1,2-b]-1,4-OXAZINES, COMPOSITIONS AND USE

James H. Jones, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 20, 1981, Ser. No. 323,771
Int. Cl.[3] C07D *265/34;* A61K *31/535*
U.S. Cl. 424—248.4 9 Claims

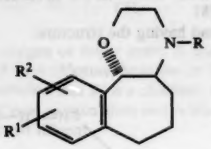
1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein R is C_{1-4} alkyl, C_{2-5} alkenyl, or phenyl-C_{1-4} alkyl; and R^1 and R^2 are

independently hydrogen, C_{1-4} alkoxy, phenyl-C_{1-4} alkoxy or hydroxy.

7. A method of treating hypertension or depression which comprises the administration to a patient in need of treatment of an effective amount of a compound of structural formula:



wherein R is C_{1-4} alkyl, C_{2-5} alkenyl, or phenyl-C_{1-4} alkyl; and R^1 and R^2 are independently hydrogen, C_{1-4} alkoxy, phenyl-C_{1-4} alkoxy or hydroxy.

4,349,549

ANTI-HYPERTENSIVE 1-SUBSTITUTED SPIRO(PIPERIDINE-OXOBENZOXAZINE)S

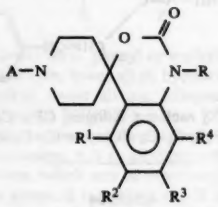
Adolph P. Roszkowski, Saratoga; Robin D. Clark, Palo Alto, and Arthur F. Kluge, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 18, 1981, Ser. No. 264,779

Int. Cl.³ A61K *31/535*; C07D *498/10*

U.S. Cl. 424—248.55 **32 Claims**

1. A compound of the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof, wherein

R^1, R^2, R^3 and R^4 are each independently hydrogen, hydroxy, lower alkyl, lower alkoxy or halo;

R is hydrogen or lower alkyl; and

A is selected from the group consisting of:

2-(benzodioxan-2-yl)-2-hydroxyethyl;

ω-(benzodioxan-2-yl)-alkyl (1–4);

3-(aryloxy)-2-hydroxypropyl, wherein aryloxy is phenyloxy optionally substituted by 1–3 moieties selected from the group consisting of lower alkyl, lower alkoxy, halo, alkylsulfamido, lower alkoxycarbonyl, cyano and trifluoromethyl;

ω-arylalkyl (1–4), wherein aryl is phenyl optionally substituted by 1–3 moieties selected from the group consisting of lower alkyl, lower alkoxy, halo, alkylsulfamido, lower alkoxycarbonyl, cyano and trifluoromethyl;

ω-aryl-ω-oxoalkyl (1–4), wherein aryl is as herein defined;

ω-aryl-ω-hydroxyalkyl (1–4), wherein aryl is as herein defined; and

ω-aryloxyalkyl (1–4), wherein aryloxy is as herein defined.

32. A method for lowering blood pressure in humans which method comprises administering to a subject in need of such treatment a therapeutically effective amount of, or a pharmaceutical composition containing a therapeutically effective amount of, the compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,349,550

FUNGICIDAL N-(PYRIDAZINOACETYL)-ANILINES

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

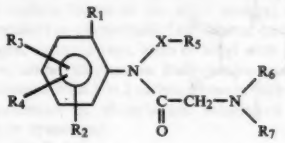
Division of Ser. No. 39,012, May 14, 1979, Pat. No. 4,244,962, which is a division of Ser. No. 905,312, May 12, 1978, Pat. No. 4,165,381, which is a division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895. This application Sep. 5, 1980, Ser. No. 184,505

Claims priority, application Switzerland, Sep. 30, 1975, 12650/75; Sep. 30, 1975, 12651/75

Int. Cl.³ A01N *43/60*; C07D *237/04*

U.S. Cl. 424—250 **8 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents a C_1–C_4-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

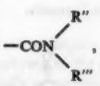
R_2 represents a hydrogen atom, a C_1–C_3-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1–C_3-alkyl group or a halogen atom,

R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 does not exceed 8, and

X represents —CH_2— or

R_5 represents —COOR′, —COSR′ or



wherein each of R′, R″ and R‴ independently represents a methyl or ethyl group,

R_6 and R_7 together with the nitrogen atom to which they are attached represents pyridazine which can be partially or completely hydrogenated and which is unsubstituted or mono- or poly-substituted by halogen or C_1–C_3-alkyl, or salts of the compounds of the formula I with an inorganic or organic acid.

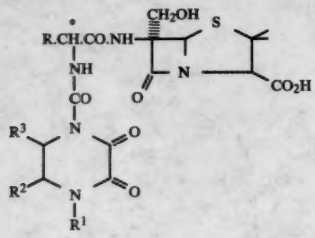
5. A fungicidal composition which contains as active component a fungicidally effective amount of a compound of the formula I according to claim 1, together with a suitable carrier therefor.

4,349,551
PENICILLIN DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Peter H. Bentley; Kenneth D. Hardy, and Peter H. Milner, all of Horsham, England, assignors to Beecham Group Limited, England

Filed Jun. 5, 1981, Ser. No. 271,007
Claims priority, application United Kingdom, Jun. 6, 1980, 8018577
Int. Cl.³ A61K *31/495;* C07D *499/70*
U.S. Cl. 424—250 11 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof:



(I)

wherein

R is phenyl, 4-hydroxy phenyl, or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from oxygen, sulphur or nitrogen, optionally substituted with hydroxy, amino, halogen or C_{1-6} alkoxy;

R^1 represents hydrogen or C_{1-6} alkyl;

R^2 and R^3 are the same or different and represent hydrogen, C_{1-6} alkyl, halogen, amino, hydroxy, or C_{1-6} alkoxy.

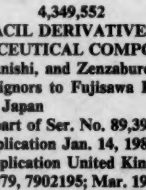
8. A pharmaceutical composition having antibacterial activity comprising an antibacterially effective amount of a compound as claimed in claim 1 together with a pharmaceutical carrier or excipient.

4,349,552
5-FLUOROURACIL DERIVATIVES, AND THEIR PHARMACEUTICAL COMPOSITIONS

Takao Takaya, Kawanishi, and Zenzaburo Tozuka, Toyonaka, both of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 89,399, Oct. 30, 1979, abandoned. This application Jan. 14, 1980, Ser. No. 111,643
Claims priority, application United Kingdom, Oct. 30, 1978, 42426/78; Jan. 22, 1979, 7902195; Mar. 19, 1979, 7909522; Jun. 4, 1979, 7919439; Canada, Oct. 29, 1979, 338650; Japan, Oct. 30, 1979, 54-140983
Int. Cl.³ C07D *239/30*
U.S. Cl. 424—251 39 Claims

1. A compound of the formula:



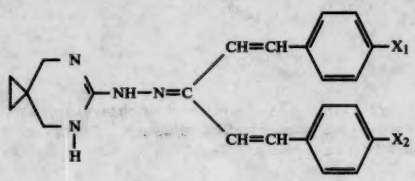
wherein R is a bridged alicyclic group selected from the group consisting of norbornyl, norbornenyl, bicyclo[2,2,2]-octyl, bicyclo[2,2,2]-2-octenyl, bicyclo[3,1,1]-heptyl and adamantyl optionally substituted by at least one substituent selected from the group consisting of lower alkyl, carboxy, lower alkoxycarbonyl, alkylidenedioxy, N,N-di(lower)-alkylcarbamoyl, amino, lower alkoxycarbonylamino and halogen.

4,349,553
SPIRO-CYCLOPROPYL AMIDINOHYDRAZONES, AND USE AS INSECT AND FIRE ANT CONTROL AGENTS

Dale G. Brown, Hopewell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

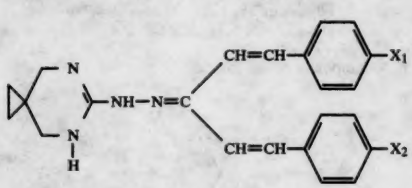
Filed May 13, 1980, Ser. No. 149,403
Int. Cl.³ A01N *43/54;* C07D *239/18*
U.S. Cl. 424—251 23 Claims

1. A compound having the structure:



wherein X_1 and X_2 each are halogen, CF_3, CHF_2O, CF_3O, CHF_2CF_2O, CHF_2S, C_1–C_3 alkoxy or C_2–C_3 alkyl.

9. A method for controlling insects comprising: contacting the insects, their habitat, and/or their food supply, with an insecticidally effective amount of a compound having the structure:



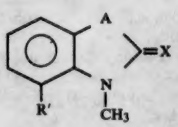
wherein X_1 and X_2 each are halogen, CF_3, CHF_2O, CF_3O, CHF_2CF_2O, CHF_2S, C_1–C_3 alkoxy or C_2–C_4 alkyl.

4,349,554
METHOD OF USING CARBOSTYRIL DERIVATIVES AS PLANT FUNGICIDES

Tamon Uematsu, Toyonaka; Satoru Inoue, Nishinomiya, and Norihisa Yamashita, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

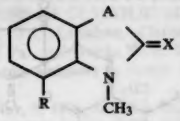
Continuation of Ser. No. 866,395, Dec. 30, 1977, abandoned. This application May 22, 1980, Ser. No. 152,430
Claims priority, application Japan, Jan. 18, 1977, 52-4769; Aug. 16, 1977, 52-98386; Aug. 17, 1977, 52-98965
Int. Cl.³ A61K *31/47;* C07D *215/22*
U.S. Cl. 424—258 12 Claims

1. A method of controlling the fungus *Pyricularia oryzae,* which comprises applying a fungicidally effective amount against *Pyricularia oryzae* of a compound of the formula



wherein X is an oxygen or sulfur atom, A is an ethylene or a vinylene group, R′ is a chlorine, bromine or fluorine atom or methyl group.

2. A composition for controlling the fungus *Pyricularia oryzae* which comprises an effective amount to combat said fungus of a compound of the formula:



wherein X is an oxygen or sulfur atom, A is an ethylene or a vinylene group, R′ is a chlorine, bromine or fluorine atom or methyl group; provided that R′ is a chlorine, bromine or fluorine atom when X is an oxygen atom and A is a vinylene group, and a carrier or inert diluent.

4,349,555

DITHIOCOMPOUNDS

Roger Crossley, Reading, and David G. Hill, Cookham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

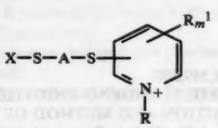
Filed Nov. 29, 1979, Ser. No. 98,419

Claims priority, application United Kingdom, Nov. 30, 1978, 46723/78

Int. Cl.[3] **A61K** *31/415, 31/425, 31/44;* **C07D** *498/00*

U.S. Cl. 424—263 **18 Claims**

1. A compound of formula



I

wherein R is lower alkyl, phenyl or aralkyl of 7 to 12 carbon atoms, R^1 is hydrogen, lower alkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, lower alkoxy, halogen, formyl, phenyl, phenylalkyl or acetal [$CH(OR^2)_2$ where R^2 is lower alkyl, or two R^4 radicals are joined to form a lower alkylene chain], m is 1 or 2, Z is an anion, A is an alkylene radical having from 1 to 3 carbon atoms, which may be substituted by lower alkyl of 1 to 6 carbon atoms, S is sulphur and X is a benzothiazole, benzimidazole, benzoxazole, or phenyl radical which may be substituted by one or more of the following radicals; halogen, nitro, lower alkoxy, aralkoxy of 7 to 12 carbon atoms, hydroxy, hydroxyloweralkyl, loweralkoxyloweralkyl, amino, lower alkylamino, diloweralkylamino, trifluoromethyl, lower alkyl, aryl or aralkyl of 7 to 12 carbon atoms or disubstituted by a loweralkylenedioxy radical and acid addition or quaternary ammonium salts of compounds wherein X is a benzimidazole radical.

11. A method for treating ulcers or hypersecretion in a mammal which comprises administering to said mammal an effective amount of a compound as claimed in claim **1**.

4,349,556

PESTICIDALLY ACTIVE 1-ACYLOXY-1-PHENYL-2-AZOLYL-ETHANES

Helmut Timmler; Wolfgang Krämer; Karl H. Büchel, all of Wuppertal; Wilhelm Brandes, Cologne; Paul-Ernst Frohberger, and Bernhard Homeyer, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

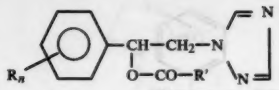
Filed Jun. 8, 1977, Ser. No. 804,832

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628419; Jun. 24, 1976, 2628420

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *233/60, 249/08*

U.S. Cl. 424—269 **16 Claims**

1. A 1-acyloxy-1-phenyl-2-azolyl-ethane or salt thereof, the 1-acyloxy-1-phenyl-2-azolyl-ethane being of the formula



in which

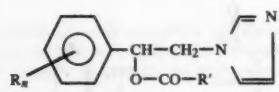
R is halogen; alkyl with 1 to 4 carbon atoms; alkoxy with 1 or 2 carbon atoms; alkylthio with 1 or 2 carbon atoms; alkylsulphonyl with 1 to 4 carbon atoms; haloalkyl with up to 4 carbon atoms; nitro; cyano; phenyl; phenoxy; or phenyl or phenoxy substituted by fluorine, chlorine, bromine, cyano, nitro or haloalkyl with 1 or 2 carbon atoms and up to 3 fluorine plus chlorine atoms;

R′ is alkyl with 1 to 6 carbon atoms; alkenyl with 2 to 4 carbon atoms; alkynyl with 2 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; haloalkyl with 1 or 2 carbon atoms; phenyl; phenylalkyl or phenoxyalkyl each with 1 or 2 carbon atoms in the alkyl moiety; such phenyl, phenylalkyl or phenoxyalkyl substituted on the phenyl by halogen, amino, cyano, nitro or alkyl with 1 or 2 carbon atoms; amino; alkylamino, dialkylamino or alkylalkylcarbonylamino with 1 or 2 carbon atoms in each alkyl moiety; phenylamino; or phenylamino substituted by halogen, nitro or cyano; and

n represents 0, 1, 2, 3, 4 or 5.

11. A method of combating fungus, bacterium or nematode pests which comprises applying to the pests or a habitat thereof a fungicidally, bactericidally or nematicidally effective amount of a compound according to claim **1**.

13. A 1-acyloxy-1-phenyl-2-azolyl-ethane or salt thereof, the 1-acyloxy-1-phenyl-2-azolyl-ethane being of the formula



in which

R is phenyl substituted by fluorine, chlorine or bromine, or phenoxy substituted by fluorine, chlorine or bromine;

R′ is alkyl with 1 to 6 carbon atoms; alkenyl with 2 to 4 carbon atoms; alkynyl with 2 to 4 carbon atoms; cycloalkyl with 5 to 7 carbon atoms; haloalkyl with 1 or 2 carbon atoms; phenyl; phenylalkyl or phenoxyalkyl each with 1 or 2 carbon atoms in the alkyl moiety; such phenyl, phenylalkyl or phenoxyalkyl substituted on the phenyl by halogen, amino, cyano, nitro or alkyl with 1 or 2 carbon atoms; amino; alkylamino, dialkylamino or alkylalkylcarbonylamino with 1 or 2 carbon atoms in each alkyl moiety; phenylamino; or phenylamino substituted by halogen, nitro or cyano; and

n represents 1, 2 or 3.

16. A method of combating fungus, bacterium or nematode pests which comprises applying to the pests or a habitat thereof a fungicidally, bactericidally or nematicidally effective amount of a compound according to claim **13**.

4,349,557

THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Dennis Bigg, Jouy en Josas, France, assignor to Synthelabo, Paris, France

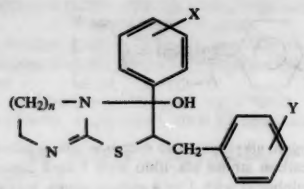
Filed Apr. 7, 1981, Ser. No. 251,744

Claims priority, application France, Apr. 8, 1980, 80 07845

Int. Cl.[3] **C07D** *277/60*

U.S. Cl. 424—270 **9 Claims**

1. A thiazole derivative of the formula:



wherein n represents 1 or 2 and each of X and Y independently of one another represents one or more substituents selected from hydrogen and halogen atoms, the trifluoromethyl radical and straight- or branched-chain alkyl and alkoxy radicals of one to four carbon atoms, and pharmaceutically acceptable acid addition salts thereof.

4,349,558

ANTI-INFLAMMATORY 8H-PHENANTHRO-[2,3-c]PYRAZOLE DERIVATIVES

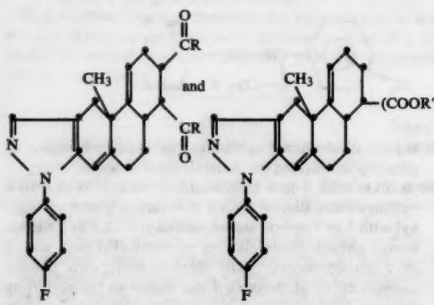
Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,440

Int. Cl.³ A61K *31/415;* C07D *231/54*

U.S. Cl. 424—273 P **5 Claims**

1. A compound selected from the group consisting of those having the formulas



wherein R and R′ are lower-alkyl.

5. A method of reducing inflammation in a mammal which comprises administering to said mammal an anti-inflammatorily effective amount of a compound according to claim **1**.

4,349,559

ANTI-INFLAMMATORY SPIRO-2H-INDENE-[2,3′]-3H-PYRAZOLO[4″,5″:7′,6′-]NAPHTHO[2,1-B]PYRAN-1,3-DIONE DERIVATIVES

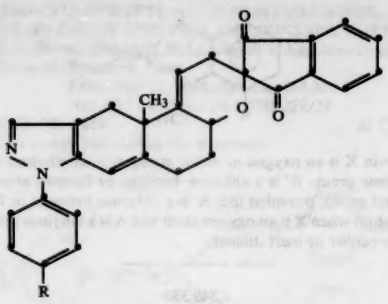
Malcolm R. Bell, East Greenbush, and John L. Herrmann, Jr., Kinderhook, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 236,216

Int. Cl.³ A61K *31/415;* C07D *491/107*

U.S. Cl. 424—273 P **5 Claims**

1. A compound of the formula



where R is hydrogen or fluorine.

5. A method of reducing inflammation in a mammal which comprises administering to said mammal an anti-inflammatorily effective amount of a compound according to claim **1**.

4,349,560

ANTIMYCOTIC IMIDAZOLYL-INDENO-THIOPHENE COMPOUNDS, COMPOSITION AND METHOD OF USE

Horst Böshagen, Haan; Karl H. Büchel, Burscheid; Wilfried Draber, Wuppertal; Ingo Haller, Wuppertal, and Manfred Plempel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

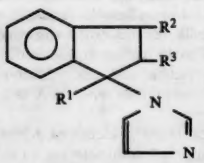
Filed Apr. 17, 1982, Ser. No. 255,068

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017881

Int. Cl.³ A61K *31/415;* C07D *409/04*

U.S. Cl. 424—273 R **11 Claims**

1. A compound which is an imidazolyl-indeno-thiophene of the formula



(I)

or a physiologically acceptable acid addition salt thereof, in which

R^1 represents a phenyl radical which is optionally mono-substituted or polysubstituted by identical or different substituents selected from alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio, in each case with 1 or 2 carbon atoms, halogen or halogenoalkyl with 1 or 2 carbon atoms and with 1 to 5 identical or different halogen atoms which are fluorine or chlorine atoms and

R^2 and R^3, together with the carbon atoms to which they are bonded complete a thiophene ring.

9. A method of combating mycoses in animals in need of said treatment which comprises administering to the animals an antimycotically effective amount of an active compound according to claim **1** either alone or in admixture with an inert pharmaceutical carrier.

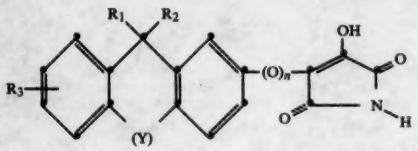
4,349,561

4-SUBSTITUTED-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc., Rahway, N.J.

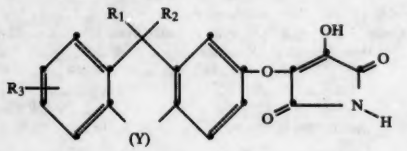
Filed Nov. 5, 1979, Ser. No. 91,293
Int. Cl.³ A61K *31/40*; C07D *207/26*
U.S. Cl. 424—274 9 Claims

1. A method of treating or preventing the formation of calcium oxalate kidney or bladder stones which comprises administering to a patient with or prone to renal lithiasis an effective amount of a compound having the structural formula:



wherein:
n is 0 or 1;
Y is CH_2—CH_2; CH=CH; CH_2—O; O—CH_2;
R_1 and R_2 are both hydrogen, hydrogen and hydroxyl or taken together are =O;
R_3 is hydrogen, halogen or a pharmaceutically acceptable salt thereof.

2. The compounds having the structural formula:



wherein
Y is CH_2—CH_2; CH=CH; CH_2—O; O—CH_2;
R_1 and R_2 are both hydrogen, hydrogen and hydroxyl or taken together are =O;
R_3 is hydrogen, halogen or a pharmaceutically acceptable salt thereof.

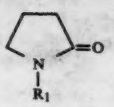
4,349,562

SUBSTITUTED 2-PYRROLIDINONES

Emilio Kyburz, Reinach, and Werner Aschwanden, Ettingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 8,674, Feb. 2, 1979, Pat. No. 4,239,770. This application Feb. 19, 1980, Ser. No. 122,646
Claims priority, application Switzerland, Feb. 10, 1978, 1404/78
The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.
Int. Cl.³ A61K *31/40*
U.S. Cl. 424—274 4 Claims

1. A pharmaceutical composition for oral administration in solid unit dosage form comprising from 10 mg. to 2500 mg. of a compound of the formula



I

wherein R_1 is o-methoxybenzoyl, m-methoxybenzyl, p-methoxybenzyl or p-fluorobenzyl, and a pharmaceutically acceptable inert carrier material.

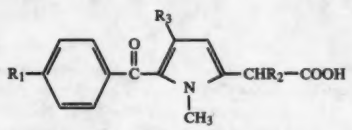
4,349,563

PHARMACEUTICAL COMPOSITIONS

David J. Gilbert, Bishops Stortford, and Derek A. Hollingsbee, Essex, both of England, assignors to Smith and Nephew Associated Companies Limited, England

Filed Apr. 13, 1981, Ser. No. 253,184
Claims priority, application United Kingdom, Apr. 18, 1980, 8012853
Int. Cl.³ A61K *31/40*
U.S. Cl. 424—274 80 Claims

1. A method of treating ocular inflammation which comprises topically administering to the eye an anti-inflammatory amount of a composition which comprises an anti-inflammatory effective amount of a compound of the formula (I):



or a pharmaceutically acceptable salt thereof wherein R_1 is chloro or methyl; R_2 is hydrogen or methyl; and R_3 is hydrogen or methyl, in combination with an ocularly acceptable carrier.

4,349,564

USE OF 1,2-DIMETHYL-3-FLUORO-, 1-METHYL-3,3-DIFLUORO-, AND 1,2-DIMETHYL-3,3-DIFLUORO-CYCLOBUTANE-1,2-DICARBONIC ACID 3,5-DICHLOROPHENYL IMIDES AS PLANT FUNGICIDES

Niklaus Bühler, Rheinfelden; Marcus Baumann, Basel; Daniel Bellus, Riehen, and Elmar Sturm, Aesch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,746
Claims priority, application Switzerland, Apr. 20, 1979, 3748/79; Mar. 31, 1980, 2539/80
Int. Cl.³ C07D *209/52*; A01N *43/38*
U.S. Cl. 424—274 3 Claims

1. A method for combatting plant pathogenic fungi which comprises applying to plants infested with such fungi, or to the locus of said plant, a fungicidally or fungistatically effective amont of 1,2-dimethyl-3-fluoro-cyclobutan-1,2-dicarbonic acid-(3,5-dichlorophenyl)-imide.

2. A method for combatting plant pathogenic fungi which comprises applying to plants infested with such fungi, or to the locus of said plants, a fungicidally or fungistatically effective amount of 1,2-dimethyl-3,3-difluoro-cyclobutane-1,2-dicarbonic acid-(3,5-dichlorophenyl)-imide.

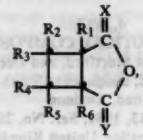
3. A method for combating plant pathogenic fungi which comprises applying to plants infested with such fungi, or to the locus of said plants, a fungicidally or fungistatically effective amount of 1-methyl-3,3-difluoro-cyclobutane-1,2-dicarbonic acid-(3,5-dichlorophenyl)-imide.

4,349,565
CYCLOBUTANEDICARBOXISOIMIDES AND USE THEREOF AS FUNGICIDES

Marcus Baumann, Basel; Niklaus Bühler, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

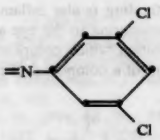
Filed Apr. 8, 1981, Ser. No. 251,835
Claims priority, application Switzerland, Apr. 14, 1980, 2858/80
Int. Cl.³ A61K *31/365;* C07D *307/93*
U.S. Cl. 424—279 9 Claims

1. A compound of the formula I



(I)

wherein one of X and Y is oxygen and the other is



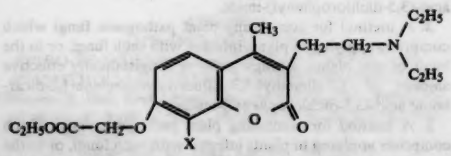
and wherein each of R_1 and R_6 independently is methyl or ethyl, each of R_2 and R_3 independently is hydrogen, fluorine or methyl or R_2 is acetoxy or chlorine whilst R_3 is hydrogen, and wherein R_4 is hydrogen, methyl or chlorine and R_5 is hydrogen or methyl, whilst R_3 and R_4 together can also form an additional valency in the four-membered cycloaliphatic ring.

4,349,566
TREATMENT OF ARRHYTHMIA WITH 8-CHLORO- OR 8-BROMOCOUMARIN DERIVATIVES

Francesco della Valle, Padua, Italy, assignor to Fidia S.p.A., Abano Terme, Italy

Continuation-in-part of Ser. No. 101,001, Dec. 6, 1979, abandoned. This application Sep. 10, 1980, Ser. No. 185,893
Claims priority, application Italy, Dec. 19, 1978, 30991 A/78
Int. Cl.³ A61K *31/37*
U.S. Cl. 424—281 6 Claims

1. A method of treating arrhythmia in mammals which comprises administering thereto an effective antiarrhythmic amount of a compound having the formula:



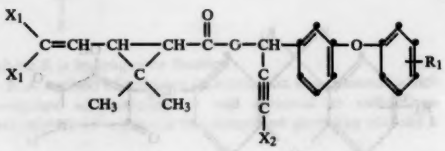
wherein X is chlorine or bromine, or a pharmaceutically acceptable salt thereof.

4,349,567
DIHALOVINYLCYCLOPROPANECARBOXYLIC ACID ESTERS AND THEIR USE IN PEST CONTROL

Peter Ackermann, Reinach; Jozef Drabek, Oberwil; Saleem Farooq, Ettingen; Laurenz Gsell, Basel; Odd Kristiansen, Möhlin, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 4, 1980, Ser. No. 174,984
Claims priority, application Switzerland, Aug. 16, 1979, 7513/79; Mar. 18, 1980, 2120/80; Jun. 20, 1980, 4750/80
Int. Cl.³ A01N *53/00;* C07C *69/743, 69/747*
U.S. Cl. 424—305 8 Claims

1. A cyclopropanecarboxylic acid ester of the formula



(I)

wherein R_1 is hydrogen, halogen, methyl, trifluoromethyl or methoxy, and X_1 and X_2 are each halogen.

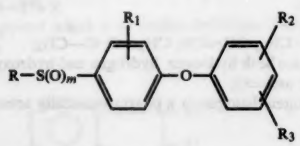
7. An insecticidal or acaricidal composition containing as active ingredient an insecticidally or acaricidally effective amount of a compound according to claim 1, together with suitable carriers.

4,349,568
SULFUR-SUBSTITUTED DIPHENYL ETHERS HAVING ANTIVIRAL ACTIVITY

Lowell D. Markley, Midland, Mich.; Yulan C. Tong, Walnut Creek, Calif., and Steven G. Wood, Orem, Utah, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 12, 1980, Ser. No. 158,964
Int. Cl.³ A61K *31/135, 31/10;* C07C *43/263*
U.S. Cl. 424—330 39 Claims

1. A compound corresponding to the formula:



wherein m represents the integer 0, 1 or 2; R represents, (C_1–C_3) alkyl or phenyl; R_1 represents hydrogen, bromo, chloro, fluoro, nitro, amino, (C_1–C_3) alkyl, (C_1–C_3) alkoxy or trifluoromethyl; R_2 represents hydroxyl, bromo, chloro, fluoro, acetyl, benzoyl, a benzoyl radical in which the benzene ring is substituted with one to five substituents selected from bromo, chloro, fluoro, methyl or methoxy, (C_1–C_3) alkyl, (C_1–C_3) alkoxy, an alkoxy group substituted with one or more substituents selected from bromo, chloro or fluoro, benzyl, a benzyl radical in which the benzene ring is substituted with one to five substituents selected from bromo, chloro, fluoro, methyl or methoxy, (C_1–C_3) alkylthio, (C_1–C_3) alkylsulfinyl, (C_1–C_3) alkylsulfonyl, or the radical —$O(CH_2)_nR_4$ wherein n represents the integer 1, 2 or 3; and R_4 represents di(C_1–C_3)alkylamino; R_3 represents hydrogen, hydroxyl, bromo, chloro, fluoro, acetyl, benzoyl, a benzoyl radical in which the benzene ring is substituted with one to five substituents selected from bromo, chloro, fluoro, methyl or methoxy, (C_1–C_3) alkyl, (C_1–C_3) alkoxy, an alkoxy group substituted with one or more substituents selected from bromo, chloro or fluoro, benzyl, a benzyl radical in which the benzene ring is substituted with one to five substituents selected from bromo, chloro, fluoro,

methyl or methoxy, (C_1–C_3) alkylthio, (C_1–C_3) alkylsulfinyl, (C_1–C_3) alkylsulfonyl, or the radical —$O(CH_2)_nR_4$ wherein n represents the integer 1, 2 or 3; and R_4 represents di(C_1–C_3)alkylamino; provided that when R_2 is bromo, chloro, fluoro, (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, (C_1–C_3) alkylsulfinyl or (C_1–C_3) alkylsulfonyl and R_3 is hydrogen, bromo, chloro, fluoro, (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, (C_1–C_3) alkylsulfinyl or (C_1–C_3) alkylsulfonyl then R_1 is amino.

12. The compound of claim 2 which is 4-(4-((trifluoromethyl)sulfonyl)phenoxy)-1,2-dichlorobenzene.

4,349,569

METHOD OF CULTURING *LACTOBACILLUS ACIDOPHILUS*

Herbert R. Peer, Storm Lake, Iowa, assignor to TransAgra Corporation, Memphis, Tenn.

Continuation-in-part of Ser. No. 711,454, Aug. 4, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 873,156

Int. Cl.³ A23C *9/123;* **C12N** *15/00, 1/36, 1/20*

U.S. Cl. 426—43 **2 Claims**

1. A process of eliminating the metal poisoning effect evidenced by the tendency to clump exhibited by *Lactobacillus acidophilus* when cultured in the presence of cobalt carbonate comprising the steps of,

(A) selecting a strain of *Lactobacillus acidophilus* of a size about three to five microns that clumps when exposed to the presence of cobalt carbonate in a milk nutrient base,

(B) culturing said *Lactobacillus acidophilus* in a milk nutrient base in the presence of cobalt carbonate to produce an initial mother culture,

(C) inoculating the mother culture in a nutrient culture medium consisting essentially of milk and cobalt carbonate with an added ammonium lactate,

(D) culturing the inoculated mother culture of step (C) through a sequence of a plurality of culture cycles to obtain an improved mother culture by inoculating the nutrient medium with the culture obtained from the next preceding culture cycle to produce after a plurality of cycles *Lactobacillus acidophilus* organisms which have a size of about 10 to 15 microns and which do not clump when cultured in the presence of cobalt carbonate and which exhibits an acidity in excess of 1.75%, and

(E) thereafter culturing the improved *Lactobacillus acidophilus* mother culture obtained from step (D) through a sequence of a plurality of culture cycles in the presence of cobalt carbonate wherein said 10 to 15 micron size and the freedom from clumping is maintained and the total organism protoplasm that may be produced in the culture process is increased.

4,349,570

PROCESS OF TREATING THE JUICE OF SQUEEZED VEGETABLE MATERIAL, SUCH AS LUCERNE, FOR PRODUCING ALIMENTARY PROTEINS AND SUPER-NITROGENATED PROTEIN FOODS, AND PRODUCTS OBTAINED BY SAID PROCESS

Emile-Pierre Segard, and Jean-Michel Lebeault, both of Villers/Coudon, France, assignors to Groupement d'Interet Economique Valpron, Compliegne, France

Filed Feb. 12, 1980, Ser. No. 120,925

Claims priority, application France, Feb. 16, 1979, 7903951

Int. Cl.³ A23K *1/00*

U.S. Cl. 426—52 **15 Claims**

1. A process of treating juice having a high protein and sugar content, obtained by squeezing vegetable matter to be used for foodstuff comprising:

(a) submitting said juice issuing from a squeezing press to a first inoculation with a mesophile homo-fermentative lactic acid producing bacteria in a proportion of at least 10^4 bacteria per milliliter, maintaining the inoculated juice at a temperature between 28 and 35 degrees C., during 15 to 20 hours under slow agitation and without aeration, obtaining a suspension of an insoluble fraction of vegetable and microbial proteins and a residual liquid phase, said suspension having a pH between 4.1 and 4.5;

(b) submitting said suspension to a second inoculation with an additional mixture of thermophile homo-fermentative lactic acid producing bacteria in a proportion of 10^4 bacteria per milliliter per 10 M^3 suspension maintaining the inoculated suspension at a temperature of 40 to 50 degrees C., during 18 to 20 hours, the final suspension having a pH of 3.3. to 3.6.

(c) separating said insoluble fraction from said liquid fraction and separately treating the residual liquid and said insoluble fraction,

said process being characterized by obtaining a mixture of mesophile homo-fermentative acid producting bacteria from at least two strains of the species, *Streptoccus lactix, Bacillus thurigiensis, Prediococccus acidilactis, Lactobacuillus Plantarum.*

4,349,571

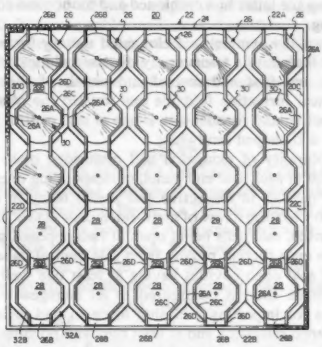
BULK CONE CONTAINER

Paul Davis, Swampscott, Mass.; David Weinstein, Baltimore, Md., and David Schneider, Lexington, Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Dec. 7, 1978, Ser. No. 967,506

Int. Cl.³ B65D *81/16, 85/36;* **B65B** *23/00*

U.S. Cl. 426—124 **21 Claims**



1. Bulk container means for shipping and dispensing a plurality of stacked and nested substantially conical fragile articles, including a matrix of protective cells each holding a stack of said nested substantially conical fragile articles, comprising:

a plurality of foam sandwich means defining said matrix, each comprising a row of a like number of multisided resilient cells, each of said cells having opposed open sides and having at least two substantially opposed and coextensive lands engageable externally thereof to close down said open sides and having sidewalls configured to engage only the largest transverse dimension of said substantially conical articles for resiliently engaging therewith to preclude axial movement of said articles in said cells; and

an external container shell dimensioned to receive said plastic foam sandwich means in compressive juxtaposition with the outermost said lands on said sandwich means;

said lands on said plurality of plastic foam sandwich means being in registry and compressive juxtaposition throughout said matrix to substantially uniformly apply a closing force to all of said resilient cells.

9. Bulk container means for shipping and dispensing a plurality of stacked and nested substantially conical fragile articles, including a matrix of protective cells each holding a stack of said nested substantially conical fragile articles, comprising:

a plurality of plastic foam sandwich means defining said matrix each comprising a row of a like number of multisided resilient cells each cell having opposed open sides and having at least two substantially opposed and coexten-

sive lands engageable externally thereof to close down said open sides and having sidewalls configured to engage only the largest transverse dimension of said substantially conical articles for resiliently engaging therewith to preclude axial movement of said articles in said cells;

an external container shell dimensioned to receive said plastic foam sandwich means in compressive juxtaposition with the outermost said lands on said sandwich means;

said lands on said plurality of plastic foam sandwich means being in registry and compressive juxtaposition throughout said matrix to substantially uniformly apply a closing force to all of said resilient cells;

said external container shell including a bottom member supporting said sandwich means and a removable cover displaced from the uppermost ends of said sandwich means;

said cells being open ended to permit articles held therein to extend therefrom into proximity with said cover; and

spacer means mutually engageable with said cover and said uppermost ends of said sandwich means precluding engagement between said articles of said cover by fixing said sandwich means between said cover and said bottom member.

17. A resilient, plastic foam sandwich structure defining a row of multi-sided cells for receiving in each cell a plurality of stacked and nested substantially conical fragile aticles and maintaining the latter in a cushioned and motionless condition, comprising:

a substantially symmetrical elongated unitary formed foam sheet including a transversely disposed elongated central panel and first and second end panels of substantially identical formation foldable one toward the other along respective and parallel side edges of said central panel to form a U-shaped sandwich;

a like plurality of elongated and multisided open cavities formed in each said end panel, corresponding ones of said open cavities in respective end panels being in opposed registry to form a row of multi-sided cells in said U-shaped sandwich, said cells being open at two opposed sides and at the ends thereof remote from said central panel;

each of said open cavities having at least one wall portion proximate thereto configured as an engageable surface means for imparting a closing force to said cells in said U-shaped sandwich and at least two wall portions extending longitudinally thereof, defining the outer boundaries thereof and configured to resiliently engage only the largest transverse dimensions of said substantially conical articles to preclude axial movement of said fragile articles in said cells;

a combshaped clamping means including an upper body portion and at least two dependent teeth defining a convergent slot therebetween with the inboard edges thereof; and

said inboard edges slidably and telescopically engaging opposed ones of said engageable surface means to selectively impart and release said closing force to and from said cells.

4,349,572
PROCESS OF RECYCLING ANIMAL WASTE

Roger R. Larson, 2501 Bedford Dr., and Efton E. Hatfield, 1103 Westlawn St., both of Champaign, Ill. 61820

Continuation of Ser. No. 688,722, May 21, 1976, which is a division of Ser. No. 553,647, Feb. 27, 1975. This application Sep. 19, 1978, Ser. No. 943,633

Int. Cl.³ A23K *3/00*

U.S. Cl. 426—335 **10 Claims**

6. A method of feeding ruminant animals comprising feeding said animals a diet comprising a bulk-furnishing component and a carbohydrate-furnishing component and including a supplement therein, said supplement consisting essentially of the reaction product of excreta selected from livestock and poultry excreta and from 0.1 to 3.0% by weight of said excreta of a liquid aldehyde.

4,349,573
LOW DENSITY COFFEE PROCESS

Arthur Stefanucci, Clifton, and Michael G. Protomastro, Woodridge, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 28, 1980, Ser. No. 210,971

Int. Cl.³ A23F *5/04*

U.S. Cl. 426—388 **9 Claims**

1. A method of producing a low density roast and ground coffee product such that 13 ounces of the coffee product will produce a brew which is equal in flavor quality and flavor strength to a brew prepared from 16 ounces of conventional roast and ground coffee which comprises:

(a) preparing a roasted high quality coffee bean fraction under short roasting conditions effective to produce a roasted high quality coffee bean fraction having a roast color of no more than 50 and a bulk density less than 0.35 g/cc.;

(b) preparing a roasted intermediate quality coffee bean fraction under short roasting conditions effective to produce a roasted intermediate quality coffee bean fraction having a roast color of 60 and a bulk density less than 0.32 g/cc.;

(c) preparing a roasted low quality coffee bean fraction under short roasting conditions effective to produce a roasted low quality coffee bean fraction having a roast color of 85 and a bulk density less than 0.40 g/cc.;

(d) blending the roasted fractions of steps (a), (b) and (c) in a ratio effective to produce a ground blend having a maximum free flow density of 0.30 g/cc. and wherein the high quality coffee constitutes 25–40%, the intermediate quality coffee constitutes 50–60% and the low quality coffee constitutes 10–15% of the final blend;

(e) grinding the roasted blend of step (d), while bypassing the grinder normalizer, to an average particle size of 880–900μ for electric percolator grind; of 830–850μ for stove percolator grind; or of 740–760μ for automatic drip grind.

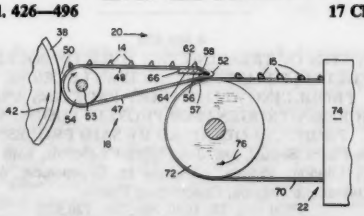
4,349,574
METHOD AND APPARATUS TO MAKE COOKIES

William G. Crothers, Princeton, N.J., assignor to Deer Park Baking Co., Hammonton, N.J.

Filed Sep. 28, 1981, Ser. No. 305,918

Int. Cl.³ A21D *6/00*

U.S. Cl. 426—496 **17 Claims**



1. A machine to make improved cookies, comprising:

(a) dough shaping means for forming dough into individual dough bits, each of said bits comprising a conical shape having a flat base;

(b) transfer conveyor means being dipsosed adjacent to said dough shaping means and having a transfer surface extending between a first location and a second location, said dough bits being removed from said shaping means at said first location by said transfer conveyor means with said base of said conical shape on said transfer surface, and said dough bits being transferred to said second location where said

transfer conveyor means further comprises means to orient said dough bits so that each of said dough bits lies on the side of the conical shape; and

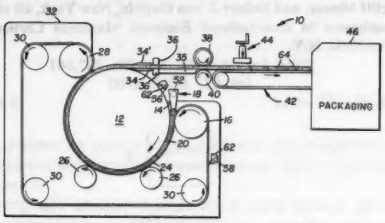
(c) oven conveyor means adjacent to said transfer surface for receiving said shaped dough on its side for baking thereof whereby said dough bits are baked to make cookies having a rounded base.

4,349,575

METHOD FOR FREEZING AND FORMING MEAT PATTIES

Eldon N. Roth, 99 Madera Ct., San Ramon, Calif. 94583

Filed Sep. 15, 1980, Ser. No. 187,370
Int. Cl.³ A23B 4/06; A23L 1/31
U.S. Cl. 426—513 **15 Claims**



1. A method for freezing and forming individual patties of protein material, comprising the steps of

processing the protein material to form a viscous paste,

introducing the viscous paste into a nip formed between a rotating drum and an application roller for forming the viscous paste into a sheet having generally uniform thickness and density,

engaging the outer surface of the sheet of protein material opposite the rotating drum with an endless belt in order to condition the outer surface of the sheet of protein material, the endless belt being trained about the application roller and about additional rollers for maintaining the belt in engagement with said sheet upon the rotating drum,

refrigerating both the rotating drum and the application roller in order to similarly refrigerate and condition both surfaces of the sheet as it is formed between said drum and the endless belt trained about the application roller,

removing the sheet from the rotating drum after it is suitably refrigerated, and forming individual patties from the sheet of protein material.

4,349,576

SOY ISOLATE IN MELTABLE IMITATION CHEESE

William F. Lehnhardt; Charles E. Streaty, Jr., both of Decatur; Walter C. Yackel, Jr., Oreana; Ho S. Yang, and Daniel K. Tang, both of Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Dec. 29, 1980, Ser. No. 220,680
Int. Cl.³ A23C 19/055, 20/00
U.S. Cl. 426—582 **9 Claims**

1. In a meltable imitation cheese product comprised of milk protein, fatty triglycerides, water, coloring agents, flavoring agents and other conventional imitation cheese additives, the improvement which comprises replacing at least 20% by weight of the milk protein with a vegetable protein isolate characterized as: (a) having an NSI of at least 90, (b) forming an isolate gel when heated to 85° C. for 30 minutes at a 15% by weight concentration in water, (c) substantially free from vegetable hydrolyzates and (d) having a melt value of at least 15 cm^2.

4,349,577

STARCH-PROTEIN CLOUDS AND PRECLOUDS

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corp., Bridgewater, N.J.

Filed Oct. 6, 1980, Ser. No. 194,494
Int. Cl.³ A23L 2/00
U.S. Cl. 426—590 **16 Claims**

1. A liquid starch-protein precloud, useful in acidic fluids having a pH of about 3.25–5.5, prepared by forming an aqueous dispersion comprising about 2.5–15 parts of a dispersed cooked starch base and about 1 part of a water-soluble protein salt at a pH above that at which said protein agglomerates; said protein being insoluble at a pH of about 3.25–5.5 and being a casein, a soy protein, a wheat protein, or mixtures thereof.

4,349,578

CONDENSED VEGETABLE SEED SOLUBLES ANIMAL FEED INGREDIENT

Kenneth N. Wright, and Gilbert W. Griffel, Jr., both of Decatur, IL, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 9, 1977, Ser. No. 831,835
Int. Cl.³ A23K 1/00; A23L 1/14
U.S. Cl. 426—630 **11 Claims**

1. An improved animal feed block characterized by its superior resistance to "fissuring" and weathering consisting essentially of about 55–65% by weight dried steep liquor concentrate, 10–20% vegetable seed meal, 5–40% salt, and 7–12% condensed vegetable seed solubles, said condensed vegetable seed solubles functioning as a nutritive binder which also imparts weather resistance and physical stability to said animal feed block.

4,349,579

PROCESS FOR SOLUBILIZING COCOA

Pierre-Benoit Raboud, Monthey; Frantisek Kubicek, Bossonnens, and Jean-Pierre Bandi, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Dec. 26, 1979, Ser. No. 106,529
Claims priority, application Switzerland, Jan. 5, 1979, 81/79
Int. Cl.³ A23G 1/00
U.S. Cl. 426—631 **11 Claims**

1. A process for solubilising cocoa which comprises:

(a) continuously injecting, under pressure, a mixture consisting of steam and a concentrated solution of an alkali carbonate into a tube containing a cocoa mass;

(b) allowing the carbonate to react with the cocoa mass under pressure in the tube at a temperature of at least 120° C. to form a reacted mass mixture within 30 to 80 seconds;

(c) subjecting the reacted mass mixture to sudden expansion; and then

(d) drying the expanded, reacted mass mixture while stirring until a dried, solubilised liquor is obtained.

4,349,580

PROCESS AND SOLUTION FOR PRESERVING GREEN PLANT TISSUES

Cesar Romero-Sierra, Bath, and John C. Webb, Kingston, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 61,688, Jul. 30, 1979, Pat. No. 4,278,715. This application May 21, 1981, Ser. No. 265,710
Int. Cl.³ A01N 3/00; C09K 15/06
U.S. Cl. 427—4 **4 Claims**

1. A process for preserving naturally green coloured plant tissues comprising immersing said tissues in a solution comprising about

70–90% by volume water

5–20% by volume of a monohydric alcohol

5–15% by volume sulphurous acid

and containing

15–25 gms cupric chloride
20–30 gms cupric sulphate and
5–12 gms citric acid per liter of solution,
for a sufficient time to effect exchange of water naturally contained in said tissues with said solution, thereby biologically preserving and fixing the green colour in said tissue.

4,349,581

METHOD FOR FORMING AN ANTICORROSIVE COATING ON A METAL SUBSTRATE

Hiroshi Asano, Ichikawa; Takayuki Shimamune, Ichihara; Toshiki Goto, Ichihara; Hideo Nitta, Ichihara, and Masashi Hosonuma, Ichihara, all of Japan, assignors to Permelec Electrode Ltd., Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 233,704
Claims priority, application Japan, Feb. 13, 1980, 55/15502
Int. Cl.³ B05D *1/08*
U.S. Cl. 427—34 **7 Claims**

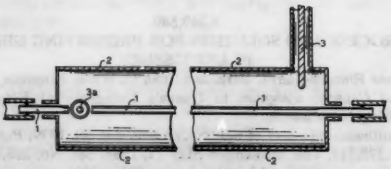
1. A method for forming an anticorrosive coating on the surface of a metal substrate, which comprises the steps of
(1) coating the surface of a metal substrate with an anticorrosive metal capable of forming an alloy with said substrate metal by a spraying procedure, and
(2) then heating the coated surface in a vacuum or in a substantially inert atmosphere by irradiating the surface with electron beams or a plasma arc to form an alloy layer only in the interface between said metal substrate and said metal coating.

4,349,582

GAS-DISCHARGE METHOD FOR COATING THE INTERIOR OF ELECTRICALLY NON-CONDUCTIVE PIPES

Hans Beerwald, Kalkgasse 2, 5370 Kall-Sistig; Günter Böhm, Haarholzer Strasse 21, and Günter Glomski, Scharnhorststrasse 2, both of 4630 Bochum, all of Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,539
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010314
Int. Cl.³ B05D *3/02, 3/06, 7/22*
U.S. Cl. 427—38 **5 Claims**



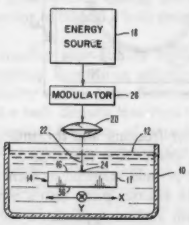
1. In a method for coating the interior of an electrically-non-conductive pipe by means of a reactive deposition of a gas flowing through the pipe, of the type wherein the gas is disassociated by an electric gas discharge and wherein the deposition occurs simultaneously throughout the total pipe length, the improvement comprising the steps of:
(a) generating a flow of an ionizable gas through said pipe; and
(b) generating gas discharge pulses in said pipe to effect a vapor deposition of said gas on the interior of said pipe, said pulses have a pulse duration and frequency adjusted to the transit time of the gas flowing through the pipe so that the time period between two successive pulses corresponds to the time which is required for filling the pipe with unused gas so that deposition occurs simultaneously over the total pipe length in a homogeneous manner.

4,349,583

LASER ENHANCED MASKLESS METHOD FOR PLATING AND SIMULTANEOUS PLATING AND ETCHING OF PATTERNS

Larysa H. Kulynych, Rochester; Lubomyr T. Romankiw, Briarcliff Manor, and Robert J. von Gutfeld, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,661
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 **9 Claims**



1. A method for selectively plating onto a surface of a workpiece without application of an electrical potential source comprising the steps of:
contacting said surface with a plating solution in the absence of a reducing agent and without application of an electrical potential source, and
directing an energy beam onto the workpiece to locally heat the surface to promote plating.

4,349,584

PROCESS FOR TAPERING OPENINGS IN TERNARY GLASS COATINGS

Doris W. Flatley, Belle Mead, and Sheng T. Hsu, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,431
Int. Cl.³ H01L *21/316*
U.S. Cl. 427—85 **8 Claims**

1. A process for forming a tapered opening in a glass passivating coating on the surface of a semiconductor body comprising the steps of:
forming a layer of dense, undoped silicon oxide on the semiconductor body;
forming a layer of ternary doped silicon oxide on the undoped layer, the doped layer characterized by having a given flow temperature;
forming a contact opening in both silicon oxide layers to expose a portion of the semiconductor body; and
heating both oxide layers to a temperature below the given flow temperature of the doped layer for a period of time sufficient to only soften and partially reflow the doped layer at the edges of the contact opening yet insufficient to form a significant oxide growth on the exposed portion of the semiconductor body.

4,349,585

GOLD-PLATED ELECTRONIC COMPONENTS AND PROCESS FOR PRODUCTION THEREOF

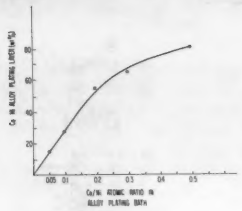
Teruyoshi Nagashima; Akio Takami, and Akiyo Kasugai, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 72,750, Sep. 5, 1979. This application Mar. 27, 1981, Ser. No. 248,375

Claims priority, application Japan, Sep. 5, 1978, 53-108976

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—125 5 Claims



1. A process for producing an electronic component having a gold-plated layer applied to an undercoat layer, comprising the steps of:

forming said undercoat layer on a metal surface of said electronic component as an undercoat layer for said gold-plated layer, said undercoat layer being a plated layer comprised of an alloy of cobalt and nickel, said undercoat layer being formed from an alloy plating bath containing cobalt and nickel;

adding, simultaneously, to said bath, a supplemental solution comprising nickel and cobalt in a lower nickel/cobalt ratio than that in said bath; and

treating said formed undercoat layer in a non-oxidizing atmosphere at a temperature of about 700° C. or more and forming a gold layer on said undercoat layer.

4,349,586

ANTI-ADHESIVE COMPOSITION BASED ON WAX IN ORGANIC SOLVENT MEDIUM

Francine Sejournant, Vitry-sur-Seine, France, assignor to Antipol Commercial Systems (Jersey) Limited, St. Helier, Channel Islands

Filed Dec. 27, 1979, Ser. No. 107,607

Claims priority, application France, Dec. 28, 1978, 78 36768

Int. Cl.³ B05D *5/08, 1/36*

U.S. Cl. 427—154 1 Claim

1. Surface treatment process for forming a protective coating against bill-posting, penetration and attachment of graffiti and/or paint, and against the adherence of dust and polluting agents in which the substrate is treated by means of an aqueous composition containing at least one synthetic wax of vegetable origin, one microcrystalline wax, or a mixture thereof having a melting point of between 45° and 110° C., followed by applying an anti-adhesive composition containing within an organic solvent without water at least one microcrystalline wax present in an amount of 10 to 30% by weight compared with the total weight of the composition and a silicone oil which is a methylpolysiloxane having a viscosity of 500 to 2,500,000 cs, a methylphenylpolysiloxane with a viscosity of between 10 and 100,000 cs or a mixture thereof present in an amount of 0.01 to 15% by weight compared with the total weight of the anti-adhesive composition.

4,349,587

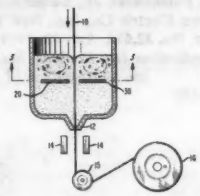
METHOD FOR COATING FIBER WAVEGUIDES

Charles J. Aloisio, Jr., Chamblee, Ga.; Lee L. Blyler, Jr., Basking Ridge, N.J.; George S. Brockway, Lawrenceville, Ga.; Arthur C. Hart, Jr., Chester, N.J., and Carl R. Taylor, Lawrenceville, Ga., assignors to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Mar. 12, 1981, Ser. No. 243,269

Int. Cl.³ B05D *1/18, 7/20;* G02B *5/14*

U.S. Cl. 427—163 11 Claims



1. Method for the manufacture of coated fiber comprising the steps of:

pulling the fiber from a fiber source,

passing the pulled fiber through a reservoir of liquid coating material and thereafter through an exit die in the reservoir,

the invention characterized in that the fiber is passed through the liquid coating material at a rate rapid enough to cause bubbles to become entrained in the reservoir, and

characterized further by the step of continuously removing bubbles from the liquid coating material.

4,349,588

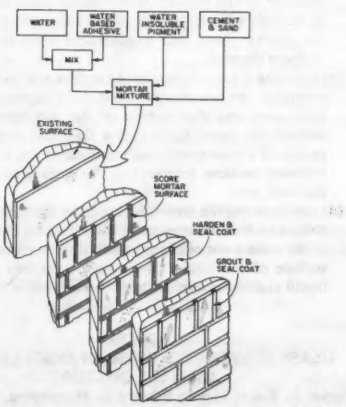
SIMULATED BRICK OR TILE

Henry Schiffer, 21835 Elbosque Way, Boca Raton, Fla. 33433

Filed Sep. 8, 1981, Ser. No. 299,722

Int. Cl.³ B05D *1/00, 3/12, 1/38;* B32B *13/12*

U.S. Cl. 427—230 3 Claims



1. A method for making a simulated brick or tile wall or floor comprising:

(a) Providing a mixture of cement, water and water-based adhesive of the consistency of mortar;

(b) Applying the mixture to a wall or floor and permitting it to partially set;

(c) Scoring indentations in a selected design on the partially set applied mixture and removing the cement from the indentations.

(d) Permitting the applied mixture to completely set;

(e) Applying mortar into the indentations as a grout and allowing it to set; and

(f) Applying a further clear water-resistant coating to the entire surface of the applied mixture.

4,349,589

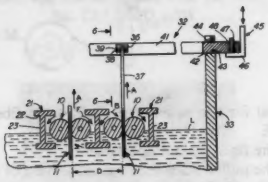
METHOD FOR DISTRIBUTING LIQUID OVER A SURFACE

Donald Dinella, Berkley Heights; Albert H. Haller, Clark, and Theodore D. Polakowski, Jr., Bergenfield, all of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 32,616, Apr. 23, 1979, Pat. No. 4,269,138. This application Jan. 27, 1981, Ser. No. 228,842

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—359 **5 Claims**



1. A method of applying a uniform coating of a liquid on both outer surfaces of a flat planar substrate, comprising the steps of:

(a) initially immersing the substrate in a bath of the coating liquid, thereby wetting both outer surfaces of the substrate with the liquid;

(b) contacting each of the wet surfaces of the substrate with a liquid-applicator roller including a solid cylindrical core, an intermediate annular layer of a resilient compliant material on the core, and an outer annular layer of a compressible liquid-absorbing material composed of chamois or synthetic chamois having inverse sponge characteristics on the intermediate layer, such rollers being mounted adjacent to and parallel to the upper surface of the liquid in the bath and on opposite sides of the substrate, whereby the rollers move into engagement with the respective surfaces thereof;

(c) applying a force between the rollers and the substrate to compress the intermediate and outer layers between the solid core and the surface of the substrate to thereby deform the outer layer into a flattened section along a region of contact with each surface of the substrate, said flattened sections intersecting the surface of the liquid of the bath; and

(d) withdrawing the wet substrate from the bath between the rollers so that movement of the substrate causes rotation of the rollers out of engagement of the substrate above the surface of the liquid of the bath, whereby the uniform liquid coating is applied to both surfaces of the substrate.

4,349,590

GLASS SUBSTRATES WITH AN INSOLUBILIZED ASPHALT COATING

Charles E. Bolen, Heath; Edward R. Harrington, Newark; Alfred Marzocchi, Newark, and Michael G. Roberts, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 30, 1981, Ser. No. 248,089

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—389.7 **6 Claims**

1. A process which comprises applying a rubber-free, non-chemically modified, asphalt to a glass substrate, heating said asphalt for a sufficient period of time to convert said asphalt to a substantially insolubilized form wherein said heating is done in the presence of a free oxygen containing gas at a temperature of at least about 140° C. for a period of time of at least about 50 hours.

4,349,591

YIELDABLE TYPE ORNAMENT ASSEMBLY

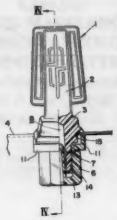
Hiroshi Kanamori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 5, 1980, Ser. No. 146,871

Claims priority, application Japan, May 9, 1979, 54-56614

Int. Cl.³ B60R *13/00*

U.S. Cl. 428—31 **12 Claims**



1. A yieldable type ornament assembly for mounting on a vehicle body comprising:

an ornament body member having a base section adapted to be fixed relative to a section of the vehicle body and an ornamented section projecting from said base section outwardly of the vehicle body; and

fastening means for fixing said base section relative to the vehicle body section, said fastening means including at least one element integrally associated with said base section and protruding downwardly through an opening in said vehicle body,

said ornamented section being formed with said base section as a single integral piece of elastic material and being elastically deformable when subjected to a force exceeding a predetermined value and restorable to its initial shape when said force disappears.

4,349,592

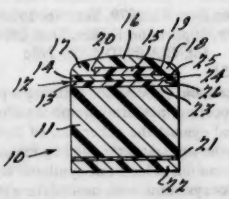
THERMOPLASTIC ELASTOMER MOLDING

Joel H. Nussbaum, Farmington Hills, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Jul. 17, 1980, Ser. No. 169,772

Int. Cl.³ B32B *31/30*; B60R *13/04*

U.S. Cl. 428—31 **8 Claims**



1. A laminate construction having an extruded body comprising thermoplastic elastomer material; an extruded outer layer of dissimilar material; and a tie sheet sandwiched between and laminated to each of said body and said outer layer; said tie sheet comprising an adhesively secured laminate of a first layer and a second layer, said first layer being heat laminated to said body and comprising a material compatible therewith, and said second layer being heat laminated to said outer layer and comprising a material compatible therewith.

4,349,593

DOUBLE KNIT FABRIC PROCESSING INTO DECORATIVE GOODS

Amihud Blechstein, Philadelphia, Pa., assignor to Penn-Gil Fabrics, Inc., Spring House, Pa.

Filed Apr. 6, 1981, Ser. No. 251,209
Int. Cl.³ E04F 13/00
U.S. Cl. 428—40 11 Claims

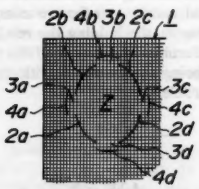
1. The method of structurally stabilizing double knit fabric which comprises the step of applying to the back thereof a coating layer of a resin latex composition comprising a copolymer and ethylene and vinyl chloride having a pH of 8.5±0.5 and a Brookfield viscosity of about 15,000 as determined by RVF employing #5 spindle @ 20 RPM, and drying the coated fabric at a temperature below 400° F.

4,349,594

WOVEN ARTICLE

Shinichi Murakami, Hatano, and Kuniaki Okumi, Mitaka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 2, 1981, Ser. No. 230,235
Claims priority, application Japan, Feb. 7, 1980, 55-13400[U]
Int. Cl.³ B32B 3/10
U.S. Cl. 428—43 7 Claims



1. A woven article comprising mutually woven warps and wefts, in which an opening having a closed contour can be formed optionally without cutting or tearing by the application of pressure only, said article being formed with a plurality of first slits extending along the contour and spaced from each other, wherein the article is further formed with at least one second slit which is offset outwardly or inwardly of the contour of the opening in an overlapping relationship with two neighboring first slits in the circumferential direction of the opening, the first and second slits being so arranged that any one of the warps and wefts extending across the opening to be formed intersects with at least one of the slits.

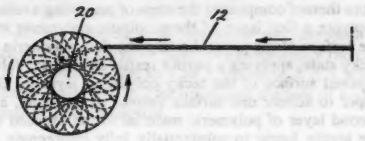
4,349,595

FRICTION MATERIAL FOR CLUTCH FACINGS AND THE LIKE

James T. Trainor, Huntington; Stanley F. Covaleski, Milford, and John C. Adelmann, Stratford, all of Conn., assignors to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Jun. 21, 1979, Ser. No. 50,596
Int. Cl.³ D04H 3/02, 3/07
U.S. Cl. 428—64 15 Claims

1. A friction element of improved resistance to wear comprising from about 5 to about 60 percent of aramid fibers having a decomposition temperature of at least about 850° F. bonded together with from about 40 to about 95 percent of heat-hardenable cement comprising a thermosetting resin and a heat-curable elastomer, said percentages being by weight based on the combined weight of fibers and cement, said element



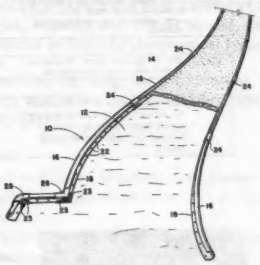
having been subjected to heat and pressure to consolidate said fibers and to cure said cement.

4,349,596

LOOSE MATERIAL RETAINER STRIP

Randle L. Hendrix, Rte. 3, Box 193, Claremore, Okla. 74017

Filed May 30, 1980, Ser. No. 154,909
Int. Cl.³ E01C 11/22
U.S. Cl. 428—83 10 Claims



1. A loose material retainer strip comprising an elongated flexible strip having a substantially C-shaped cross-section, a base lip thereof being wider than a top lip thereof, a plurality of longitudinally spaced apertures in the base lip for securing the strip in place with appropriate stakes, the material of said strip being flexible and resilient to substantially retain its C-shaped cross-section, whereby upon installation the base lip is secured to the ground with stakes with the open side of the C-shaped strip facing the loose material to be retained, the loose material being filled or pulled over said base lip.

4,349,597

PRODUCTION OF SYNTHETIC LEATHER

Jerome Fine, and Gene N. Harrington, both of Cleveland, Tenn., assignors to Cleveland Plastics of Tennessee, Inc., Cleveland, Tenn.

Filed Jul. 7, 1980, Ser. No. 166,543
Int. Cl.³ B32B 5/14, 5/18, 5/20, 5/24, 5/32
U.S. Cl. 428—95 29 Claims

1. A fabric-reinforced composite sheet material having opposite surfaces of leather-like appearance comprising:

(a) a textile fabric having a first polymeric layer disposed within and filling the interstices of the fabric to the extent that it is present adjacent opposite faces of the fabric;

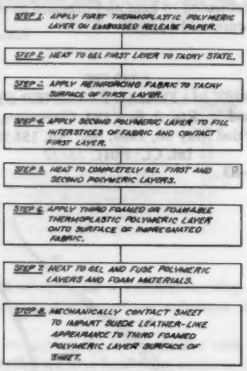
(b) a second thermoplastic polymeric layer on one face of the fabric bonded to said first polymeric layer and having an outer leather-like surface appearance;

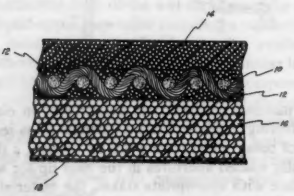
(c) a third thermoplastic essentially fiber-free polymeric foam layer on the opposite face of said fabric bonded to said first polymeric layer and having an outer suede leather-like surface appearance; and wherein

(d) said fabric faces are completely covered with the polymeric layers, and both leather-like outer surfaces of the composite sheet are heat-sealable, flow-moldable and

reversible for subsequent manufacture of products having a natural leather-like appearance.

21. A method of producing a composite, fabric-reinforced sheet material having a leather-like surface appearance on both faces thereof comprising the steps of providing a release paper, applying a first layer of thermoplastic polymeric material to the surface of the paper, heating the first polymeric layer to a tacky state, applying a porous textile reinforcing fabric to the exposed surface of the tacky polymeric layer on the release paper to adhere one surface thereof to the layer, applying a second layer of polymeric material to the exposed surface of the textile fabric to substantially fully impregnate the interstices thereof and contact said first layer of thermoplastic polymeric material on the release paper, heating said first and second layered textile fabric to substantially gel the first and second layers thereon, applying a third layer of fiber-free foamed or heat-foamable thermoplastic polymeric material to the surface of the reinforcing fabric to contact the second polymeric layer disposed within the interstices thereof, heating the resultant composite layered product to cure and solidify the polymeric material layers and bond the same into a composite structure, and to foam the third thermoplastic layer, if heat-foamable, and mechanically contacting the foamed third polymeric layer surface to impart a suede leather-like appearance thereto.


STEP 1. APPLY FIRST THERMOPLASTIC POLYMERIC LAYER ON EMBOSSED RELEASE PAPER.
STEP 2. HEAT TO GEL FIRST LAYER TO TACKY STATE.
STEP 3. APPLY REINFORCING FABRIC TO TACKY SURFACE OF FIRST LAYER.
STEP 4. APPLY SECOND POLYMERIC LAYER TO FILL INTERSTICES OF FABRIC AND CONTACT FIRST LAYER.
STEP 5. HEAT TO COMPLETELY GEL FIRST AND SECOND POLYMERIC LAYERS.
STEP 6. APPLY THIRD FOAMED OR FOAMABLE THERMOPLASTIC POLYMERIC LAYER ONTO SURFACE OF IMPREGNATED FABRIC.
STEP 7. HEAT TO GEL AND FUSE POLYMERIC LAYERS AND FOAM MATERIALS.
STEP 8. MECHANICALLY CONTACT SHEET TO IMPART SUEDE LEATHER-LIKE APPEARANCE TO THIRD FOAMED POLYMERIC LAYER SURFACE OF SHEET.



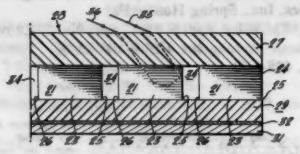
4,349,598

HIGH INCIDENCE ANGLE RETROREFLECTIVE MATERIAL

Michael L. White, Morrisville, Pa., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1976, Ser. No. 746,281
Int. Cl.³ B32B *3/30*
U.S. Cl. 428—161 **10 Claims**

1. In a retroreflective material, the combination of a transparent surface layer, a backing layer, and an array of reflecting elements between said layers, each of said reflecting elements having a rectangular base, two mutually perpendicular rectangular faces meeting said base at 45° angles, and two parallel triangular faces perpendicular to said rectangular faces, said triangular and rectangular faces defining a pair of cube corners therebetween, said reflecting elements being uniformly arranged with their bases adjacent said surface layer and their



cube corners adjacent said backing layer, and wherein opposing triangular faces of adjacent elements are spaced apart to provide internal reflection therefrom.

4,349,599

ADHESIVE TAPES

Alfred A. Adams, Bungay, England, assignor to Crystic Systems Limited, Northamptonshire, England

Filed May 21, 1979, Ser. No. 40,915
Claims priority, application United Kingdom, May 23, 1978, 21708/78
Int. Cl.³ B32B *5/02*
U.S. Cl. 428—233 **8 Claims**

1. In a reinforced plastics article comprising fiber reinforcement and a plastic impregnant, the improvement comprising providing a textile, selecting as an adhesive on at least one of the surfaces of said textile an adhesive compatible with the plastics material, the textile holding the reinforcement of the article in position during impregnation of the reinforcement by the plastics, and being incorporated with the reinforcement into the finished article.

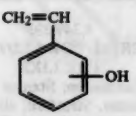
4,349,600

COLOR DEVELOPER FOR LEUCO PIGMENT AND RECORDING MATERIAL COMPRISING SAME

Nobuhiro Miyakawa, Suita, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 28, 1980, Ser. No. 201,591
Claims priority, application Japan, Nov. 19, 1979, 54-14899
Int. Cl.³ B32B *3/26*
U.S. Cl. 428—320.8 **4 Claims**

1. In a thermosensitive recording element which comprises a substrate and a recording layer formed on said substrate, the improvement wherein said recording layer comprises independent dispersed phases of an oligomer or polymer of a vinyl phenol represented by the following formula:



and a leuco pigment which is colorless or has a light color in the normal state and has the ability to form color images upon reacting with said oligomer or polymer in a water-soluble or water-dispersible inactive polymeric binder, said oligomer or polymer having a melting point of softening point of 95° to 220° C. and an average molecular weight of from 242 to 24000, the weight ratio of the leuco pigment to the oligomer or polymer being in the range of from 1/5 to 1/40.

4,349,601

PROTECTIVE SKIN ON INTRICATELY MOLDED PRODUCT

Walter H. Brueggemann, Chagrin Falls, and John A. Brenner, Independence, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 2,658, Jan. 11, 1979, Pat. No. 4,205,028. This application Dec. 21, 1979, Ser. No. 106,032

Int. Cl.[3] B29C *5/08;* B29D *9/00*

U.S. Cl. 428—323 8 Claims

1. A molded product comprising an inner body of an organic thermosetting resin and a substantially continuous resinous film or skin substantially covering said body and comprising a polyester resin that is cross-linked and chemically reacted with said organic resin, said product having intricate, curving surface contours and said film being smooth and free of surface tears and blemishes.

4,349,602

SUBSTRATES COATED WITH A THERMOSET ACRYLIC PRIMER AND AN ALKOXYSILYLBENZOTRIAZOLE UV STABILIZER

Ta-Yen Ching, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 154,625, May 30, 1980, Pat. No. 4,316,033. This application Oct. 7, 1981, Ser. No. 309,352

Int. Cl.[3] B32B *27/30; 27/08*

U.S. Cl. 428—331 2 Claims

1. An article comprising

(A) a substrate coated with a thermoset acrylic primer,

(B) a hard, protective coating thereon comprising an aqueous coating composition which comprises before curing,

(a) a dispersion of a colloidal silica in a solution of the partial condensate of a silanol having the formula,

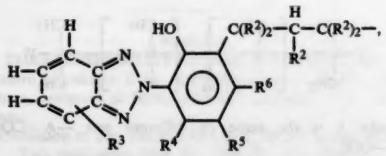
$$R^7Si(OH)_3,$$

where R^7 is selected from the group consisting of $C_{(1-8)}$ alkyl and $C_{(6-13)}$ aryl, at least 70 weight percent of which is $CH_3Si(OH)_3$, in a mixture of an aliphatic alcohol and water, said dispersion containing from 10 to 50 percent by weight of solids, said solids consisting essentially of 10 to 70% by weight of colloidal silica and 30 to 90% by weight of the partial condensate and

(b) an effective amount of an ultraviolet light absorbing agent comprising a compound having the formula,

$$(RO)_{4-a-b}\overset{(R^1)_b}{\overset{|}{Si}}(Z)_a \qquad (1)$$

where Z is



R is a $C_{(1-8)}$ alkyl radical, R^1 is a $C_{(1-8)}$ alkyl or $C_{(6-12)}$ aryl radical, R^2 is selected from hydrogen and R, R^3 is selected from hydrogen, $C_{(1-8)}$ alkyl, $C_{(1-8)}$ alkoxyl, carbalkoxy, hydroxy, amino, halogen, and $Q\text{-}(CH_2)_3\text{-}Si(OR)_3$, where Q is selected from —O—, —NR^2-, and

R^4-R^6 are selected from hydrogen and the same or different $C_{(1-8)}$ alkyl, $C_{(1-8)}$ alkoxy and halogen radicals, a is an integer equal to 1 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive and the sum of a+b is equal to 1 to 3 inclusive.

4,349,603

LAMINATED MULTILAYER STRUCTURE

Masao Kameyama, Iwakuni, and Teiichi Shiomi, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,470

Claims priority, application Japan, May 26, 1980, 55-68874; Feb. 19, 1981, 56-22198

Int. Cl.[3] B32B *27/32*

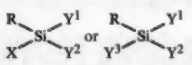
U.S. Cl. 428—334 8 Claims

1. A laminated multilayer structure comprising

(1) a thermoplastic olefin resin layer (A) in the form of a shaped article,

(2) a primer layer (B) liquid-coated on and contacted with at least one surface of the layer (A) and composed of

(b_1) 20 to 100% by weight based on the weight of the layer (B) of a graft-modified synthetic olefinic rubber or graft-modified 4-methyl-1-pentene resin obtained by grafting an organic silane compound having the following formula



wherein R represents a monovalent olefinically unsaturated hydrocarbon radical having up to 20 carbon atoms or a monovalent olefinically unsaturated hydrocarbonoxy radical having up to 11 carbon atoms, X represents a monovalent hydrocarbon radical selected from the class consisting of alkyl groups having 1 to 20 carbon atoms and aryl groups having 6 to 8 carbon atoms, and Y^1, Y^2 and Y^3 are identical or different and each represents a functional member selected from the class consisting of alkoxy groups having 1 to 6 carbon atoms, alkylcarbonyl groups having 1 to 10 carbon atoms, oxime groups having 3 to 15 carbon atoms and substituted amino groups having a substituent selected from lower alkyl groups and a phenyl group,

and (b_2) 0 to 80% by weight based on the weight of the layer (B) of an ultraviolet stabilizer, and

(3) a cured layer (C) liquid-coated on and contacted with the layer (B) and derived from an uncured crosslinkable Si-containing compound selected from the group consisting of organo-alkoxysilanes, organo-acyloxysilanes and organo-polysiloxanes.

8. The laminated multilayer structure of claim 1 wherein the thickness of the layer (B) is from about 0.01 to about 1 micron and the thickness of the layer (C) is from about 0.1 to about 100 microns.

4,349,604

CONTINUOUS FILAMENT YARN WITH WOOL-LIKE HAND

Lawrence E. Blackmon, Foley, Ala.; John R. Dees, Pensacola, Fla.; Darrell A. Kelly, Milton, Fla.; Wayne T. Mowe, and Jing-peir Yu, both of Pensacola, Fla., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 6,139, Jan. 24, 1979, which is a division of Ser. No. 947,687, Oct. 2, 1978, abandoned. This application Oct. 31, 1980, Ser. No. 202,551

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—370 **7 Claims**

1. A multifilament yarn comprising first and second classes of filaments;

a. each of said first class of filaments being melt spun polyester filaments of at least two polymer streams fused together at different extrusion rates to provide filaments of nonround cross sections having shrinkage profiles in the form of shrinkage peaks and valleys along their lengths, said shrinkages peaks and valleys being out of phase from filament to filament and having amplitudes and spacings along each of said filaments of said first class selected such that said yarn has a crimp above 2%;

b. each of said second class of filaments having lower shrinkage than the shrinkage of said filaments of said first class.

4,349,605

FLAME RETARDANT RADIATION CURABLE POLYMERIC COMPOSITIONS

James W. Biggs, Lebanon, and Melvin F. Maringer, Cincinnati, both of Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Filed Sep. 9, 1980, Ser. No. 185,460

Int. Cl.³ C08F *2/54*; C08K *3/22, 5/09, 5/20*

U.S. Cl. 428—389 **15 Claims**

1. A radiation crosslinkable polymeric composition comprising:

(a) a copolymer of ethylene and a vinyl ester of a C_2–C_6 aliphatic carboxylic acid, a C_1–C_6 alkyl acrylate or a C_1–C_6 alkyl methacrylate,

(b) from 80 to 400 parts of hydrated inorganic filler per 100 parts of copolymer,

(c) 2 to 8 parts of an alkoxy silane per 100 parts of hydrated inorganic filler, and

(d) a lubricating effective amount of a lubricant comprising lauric acid and ethylene-bis-stearamide.

4,349,606

CONDUCTIVE DEVICE USING CONDUCTIVE POLYMER COMPOSITIONS

Yoshio Kishimoto, Hirakata, and Wataru Shimotsuma, Ibaraki, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jan. 23, 1981, Ser. No. 227,923

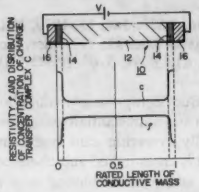
Claims priority, application Japan, Jan. 24, 1980, 55-7264

Int. Cl.³ B32B *7/06*; H01C *7/10*

U.S. Cl. 428—411 **10 Claims**

1. In a device which uses a conductive polymer composition which comprises a mass of a conductive polymer composition in which a conductive charge transfer complex is contained in a polymer matrix, the improved device comprising at least a pair of electrodes electrically connected to said mass at a distance from each other, and at least one layer of low resistivity interposed between said mass and one of the paired electrodes in a series relation with said mass, said layer having contained therein at least one component of said charge transfer complex in an amount larger than said mass.

7. In a device which uses a conductive polymer composition in which a conductive charge transfer complex is contained in



a polymer matrix, the improved device comprising at least a pair of electrodes electrically connected to said mass at a distance from each other, at least one of the paired electrodes having contained therein at least one component of said conductive charge transfer complex.

4,349,607

UV STABILIZERS, COATING COMPOSITIONS AND COMPOSITE STRUCTURES OBTAINED THEREFROM

Ta-Yen Ching, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 100,441, Sep. 5, 1979, Pat. No. 4,288,631. This application Mar. 30, 1981, Ser. No. 248,182

Int. Cl.³ C08K *5/13*

U.S. Cl. 428—412 **5 Claims**

3. A composite structure comprising

(A) A thermoplastic organic polymer sheet and

(B) A cured coating of organic resin having a stabilizing amount of a UV stabilizer selected from the class consisting of 2,4-dihydroxy-4′-methoxy-3-methylbenzophenone and 3-methyl-2,4,4′-trihydroxybenzophenone.

4,349,608

MAGNETIC RECORDING MEDIUM

Jozo Shimizu, Nagaoka; Satoru Yamaguchi, Suita, and Shigeo Aoyama, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

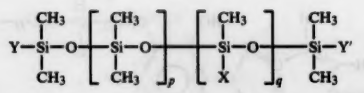
Filed Aug. 19, 1981, Ser. No. 294,220

Claims priority, application Japan, Aug. 20, 1980, 55-115038; Aug. 20, 1980, 55-115040; Aug. 20, 1980, 55-115041; Aug. 20, 1980, 55-115042

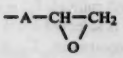
Int. Cl.³ B32B *27/38, 9/04*; H01F *10/02*

U.S. Cl. 428—413 **3 Claims**

1. A magnetic recording medium which comprises a base material and a magnetic layer provided thereon, said magnetic layer comprising magnetic particles and a binder, characterized in that said magnetic layer further comprises at least one silicone compound of the formula:



wherein X is the same or different and —A—COOH, —A—OH,



or —A—NH_2 in which A is a divalent hydrocarbon group having not more than 26 carbon atoms, Y and Y′ are each —X

or —CH_3, p is an integer of 0 to 1,000 and q is an integer of 1 to 500 but p+q is not more than 1,000.

4,349,609

ELECTRONIC DEVICE HAVING MULTILAYER WIRING STRUCTURE

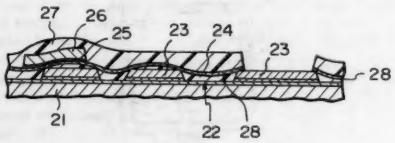
Shiro Takeda, Sagamihara, and Minoru Nakajima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 20, 1980, Ser. No. 161,561

Claims priority, application Japan, Jun. 21, 1979, 54/77557; Dec. 28, 1979, 54/171005; Jan. 16, 1980, 55/3288

Int. Cl.³ B32B *17/06*

U.S. Cl. 428—429 **20 Claims**



1. An electronic device having a multilayer wiring structure comprising:

a substrate having formed thereon a first metal wiring layer, and;

an interlayer insulation layer comprised of a cured coating of a ladder-type silsesquioxane polymer, formed on the substrate and on said first metal wiring layer and having formed thereon a second metal wiring layer.

4,349,610

METHOD FOR WATERPROOFING PAPER

Daniel Parker, Los Angeles, Calif., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 28,242, Apr. 9, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,228

Int. Cl.³ B32B *9/04*; A21D *13/00*

U.S. Cl. 428—447 **18 Claims**

14. A paper web having improved water repellency on at least one surface thereof while retaining substantially all of its natural porosity toward gases,

said surface comprising a silicone polymer produced by reaction of water in said web with a hydroxysilane which itself is the hydrolysis product of an alkyl alkoxysiloxane having the formula:

where A is H, CH_3 or B and B is an OR group in which R is methyl or ethyl.

4,349,611

THERMOSENSITIVE RECORDING MATERIAL

Nobuhiro Miyakawa, Kobe, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

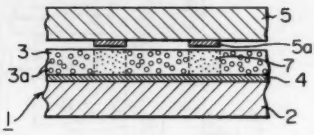
Continuation of Ser. No. 971,833, Dec. 19, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 136,068

Claims priority, application Japan, Dec. 21, 1977, 52-154855

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—500 **8 Claims**

8. A thermosensitive electrostatic recording material comprising a thermally stable substrate having at least one electrically conductive surface and applied to the conductive surface of the substrate, a thermosensitive recording layer, said thermosensitive recording layer comprising a matrix of an electrically insulating, film-forming thermoplastic resin and dispersed



as a fine powder in the matrix, a linear aliphatic dicarboxylic acid having at least 13 carbon atoms or its ammonium salt.

4,349,612

METAL WEB

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 963,313, Nov. 27, 1978, abandoned, Ser. No. 851,504, Nov. 14, 1977, Ser. No. 809,189, Jun. 23, 1977, and Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,453, each is a continuation-in-part of Ser. No. 614,834, Sep. 19, 1975, Pat. No. 4,141,760, said Ser. No. 851,504, Ser. No. 809,189, and Ser. No. 752,855, each is a continuation-in-part of Ser. No. 694,951, Jun. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 614,834, , which is a continuation-in-part of Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,047, Ser. No. 404,665, Oct. 9, 1973, Pat. No. 3,948,689, and Ser. No. 357,616, May 7, 1973, Pat. No. 3,948,687, said Ser. No. 404,665, and Ser. No. 357,616, each is a continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371, and Ser. No. 219,514, Jan. 20, 1972, Pat. No. 3,801,357, said Ser. No. 90,682, and Ser. No. 219,514, each is a continuation-in-part of Ser. No. 837,711, Jun. 30, 1969, abandoned. This application Mar. 30, 1979, Ser. No. 25,456

Int. Cl.³ B32B *15/01, 15/04, 15/18*

U.S. Cl. 428—607 **8 Claims**

1. A self-supporting metal web having a pyrophoric surface covered by a solid or liquid coating that does not block the pyrophoric property and undergoes a pyrophoricity-intensifying exothermic change when subjected to the pyrophoricity of that surface.

4,349,613

METHOD AND APPARATUS FOR ELECTROCHEMICAL ENERGY PRODUCTION

August Winsel, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,372

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949011

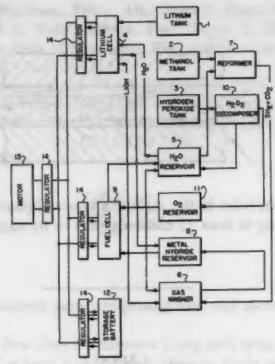
Int. Cl.³ H01M *8/06*

U.S. Cl. 429—17 **7 Claims**

1. Process for electrochemical energy supply from lithium high energy cells with aqueous electrolytes which operate in a combined system with hydrogen/oxygen fuel cells and which form lithium hydroxide by the cell reaction in the lithium cell, the process comprising

producing in a reformer carbon dioxide and hydrogen gas

from hydrocarbons or hydrocarbon compounds and water,



transforming the carbon dioxide and the lithium hydroxide into lithium carbonate, and

supplying the hydrogen gas to the fuel cell.

4,349,614

PLATINUM THIRD ELECTRODE TO IMPROVE FLOAT POLARIZATION OF STANDBY BATTERIES

John Werth, Princeton, N.J., assignor to Exide Corporation, Philadelphia, Pa.

Filed Mar. 6, 1981, Ser. No. 241,088

Int. Cl.³ H01M *10/44*

U.S. Cl. 429—50 **3 Claims**

1. The method of maintaining float polarization voltages at both positive and negative plates of a lead-acid cell used on standby service within the proper range, which comprises establishing a cell having at least one positive plate and at least one negative plate immersed in electrolyte, immersing completely an auxiliary depolarizing platinum electrode in the cell electrolyte, connecting said electrode in the cell electrolyte, connecting said electrode electrically to the negative plate in the cell whereby hydrogen evolves on said electrode due to the float current, the parasitic current commensurate with said hydrogen evolution increasing the float current to the positive plate in said cell, enabling said positive plate to reach full charge while on float service.

3. A lead-acid cell having a positive and a negative plate immersed in the cell electrolyte and having a platinum or palladium auxiliary depolarizing electrode immersed completely in the cell electrolyte and electrically connected to said negative plate, employing said cell in float service with hydrogen evolving from said electrode.

4,349,615

RECHARGEABLE ELECTROCHEMICAL CELL AND METHOD FOR CHARGING SAME

Ronald P. Reitz, P.O. Box 1543, Annapolis, Md. 21404

Filed Dec. 23, 1980, Ser. No. 219,491

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.³ H01M *6/38*

U.S. Cl. 429—110 **5 Claims**

1. An electrochemical storage cell comprising:

(a) a first electrode means which is a cathode means;

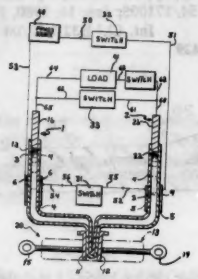
(b) a second electrode means which is an anode means;

(c) an electrolyte solution means in good physical contact with said first and said second electrode means;

(d) a flexible, non-porous, electrically insulative housing means whereby said first and said second electrode means and said electrolyte solution are housed;

(e) a means for bending said flexible housing such that said means for bending resticts or prevents altogether the free flow of electrolytic ions from said first electrode means to said second electrode means and from said second electrode means to said first electrode means;

(f) a third electrode means spaced proximate and spaced from the bending portion of said flexible, non-porous, electrically insulative housing means, said third electrode means also being positioned proximate to but electrically insulated from said electrolyte solution;



(g) and a fourth electrode means spaced proximate to the bending or crimping portion of said flexible, non-porous, electrically insulative housing means, said fourth electrode means being spaced proximate to but electrically insulated from said electrolyte solution, said fourth electrode means also being positioned opposite to said third electrode means with respect to the bending or crimping portion of said flexible housing.

4,349,616

DISAZO PIGMENT CONTAINING ELECTROPHOTOGRAPHIC ELEMENT

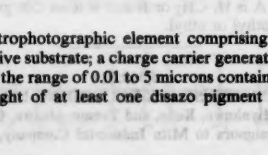
Masaomi Sasaki, Shizuoka, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,383

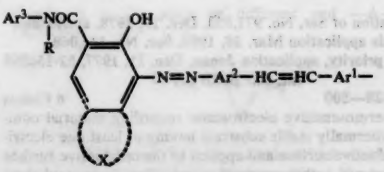
Claims priority, application Japan, Dec. 28, 1979, 54-170421; Dec. 28, 1979, 54-170422; Dec. 29, 1979, 54-172602; Apr. 23, 1980, 55-54632; Oct. 13, 1980, 55-141923; Nov. 26, 1980, 55-167015; Nov. 26, 1980, 55-167016

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—58 **19 Claims**



1. An electrophotographic element comprising an electrically conductive substrate; a charge carrier generating layer of a thickness in the range of 0.01 to 5 microns containing 30% or more by weight of at least one disazo pigment having the formula (I):



(I)

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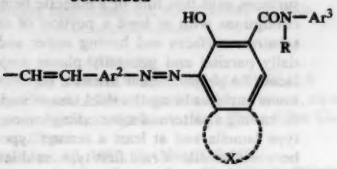


wherein Ar^1 and Ar^2 are phenylene, with the provisos that (1) when Ar^1 is 1,4-phenylene, Ar^2 is 1,2- or 1,3-phenylene, (2) when Ar^1 is 1,3-phenylene, Ar^2 is 1,2-, 1,3- or 1,4-phenylene, and (3) when Ar^1 is 1,2-phenylene, Ar^2 is 1,3-phenylene, X is selected from the group consisting of substituted or unsubstituted aromatic rings, indole, carbazole, or benzofuran, Ar^3 is selected from the group consisting of substituted or unsubstituted aromatic rings, carbazole, or dibenzofuran, and R is hydrogen, lower alkyl, or substituted or unsubstituted phenyl; and a charge transfer layer of a thickness in the range of 3 to 50 microns containing 10 to 95 percent by weight of a charge transfer material and a binder, said charge carrier generating layer and said charge transfer layer being superposed on said substrate.

4,349,617

FUNCTION SEPARATED TYPE ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEMBERS AND PROCESS FOR PRODUCTION THEREOF

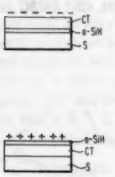
Kazuhiro Kawashiri; Yuzo Mizobuchi; Akio Higashi; Hiroshi Tamura; Keiji Takeda, and Masayoshi Nagata, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 23, 1980, Ser. No. 199,877

Claims priority, application Japan, Oct. 23, 1979, 54-136755; Nov. 9, 1979, 54-145200

Int. Cl.³ G03G *5/14, 5/082*

U.S. Cl. 430—59 **27 Claims**



1. A function separated type electrophotographic light-sensitive member comprising an electrically conductive support having thereon a light-sensitive layer comprising a hydrogen-doped amorphous silicon semiconductor, and an organic electric charge transport layer containing at least one positive charge transport carrier selected from the group consisting of pyrazolines, arylalkanes, arylketones, arylamines and chalcones.

4,349,618

PHOTOCONDUCTIVE COMPOSITIONS AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS USING SAID COMPOSITIONS

Syunichi Kondo; Hirotsugu Nomaguchi, and Hideo Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

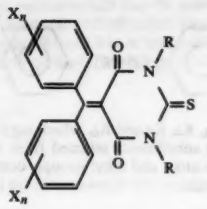
Filed Jul. 29, 1981, Ser. No. 287,849

Claims priority, application Japan, Jul. 29, 1980, 55/104209

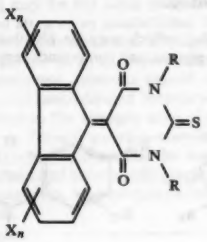
Int. Cl.³ G03G *7/00*

U.S. Cl. 430—83 **14 Claims**

1. A photoconductive composition comprising a mixture of a photoconductive substance and a thiobarbituric acid derivative represented by formula (1) or (2) below:



(1)



(2)

wherein X represents a hydrogen atom or a substituent having a Hammett's meta-position substituent constant (σm) value of at least +0.2, n represents 1 or 2, and R represents an alkyl group containing 1 to 12 carbon atoms or a phenyl group.

4,349,619

PHOTORESIST COMPOSITION

Yoichi Kamoshida; Toshiaki Yoshihara, both of Yokohama; Yoshiyuki Harita, Kawasaki, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

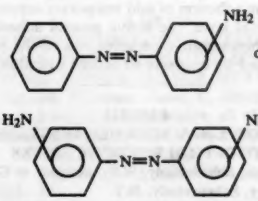
Filed Sep. 10, 1980, Ser. No. 185,771

Claims priority, application Japan, Sep. 19, 1979, 54-120406; Nov. 9, 1979, 54-145051; Apr. 28, 1980, 55-56682; Aug. 13, 1980, 55-111386

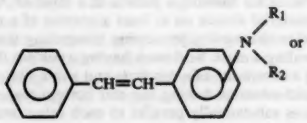
Int. Cl.³ G03C *1/70, 1/71*

U.S. Cl. 430—196 **17 Claims**

1. A photoresist composition comprising a cyclized product of a conjugated diene polymer or copolymer, a photo-cross-linking agent soluble in an organic solvent and at least one member selected from the group consisting of compounds represented by the formulas:



compounds represented by the formulas:



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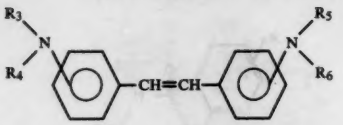
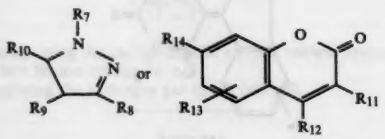


wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be identical or different, represent substituents selected from the group consisting of hydrogen atom and alkyl groups, compounds represented by the formula:

Ar—N=N—NH—Ar'

wherein Ar and Ar', which may be identical or different, represent aromatic groups, and compounds represented by the formulas:



wherein R_7, R_8, R_9, R_{10}, R_{12} and R_{13}, which may be identical or different, represent substituents selected from the group consisting of hydrogen atom, alkyl groups, alkenyl groups, aryl groups, and aralkyl groups; R_{11} represents a substituent selected from the group consisting of hydrogen atom and aryl groups; and R_{14} represents a substituent selected from the group consisting of hydrogen atom and amino group.

4,349,620

SOLVENT DEVELOPABLE PHOTORESIST FILM

Clifford R. Cyr, Athens, Pa., and Nancy C. Hagan, East Brunswick, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 49,210, Jun. 15, 1979, abandoned. This application Dec. 17, 1980, Ser. No. 217,505

Int. Cl.³ G03C *1/58*

U.S. Cl. 430—259 **18 Claims**

11. Dry photosensitive resist film consisting of a temporary support film, thermoplastic photosensitive layer, and cover film, characterized by the photosensitive layer consisting of at least two partial layers, said cover film being strippable from its respective partial layer without removal of said temporary support film from its respective partial layer and the resultant bared surface of said partial layer having greater adhesion to copper than the adhesion of said temporary support film to its respective partial layer, the above general adhesion relationships of the photosensitive compositions of the partial layers being unchanged by exposure to actinic radiation.

4,349,621

PROCESS FOR X-RAY MICROLITHOGRAPHY USING THIN FILM EUTECTIC MASKS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,985

Int. Cl.³ G03C *5/04;* B05D *3/06;* G21K *1/00*

U.S. Cl. 430—311 **17 Claims**

1. A process for forming a pattern in a layer of X-radiation sensitive material situate on at least a portion of a microelectronic device undergoing processing comprising the steps of:

(a) providing a mask, said mask having a pattern therein and being a composite of a substrate and a thin film of a eutectic, said substrate having top and bottom major opposed surfaces substantially parallel to each other and an outer peripheral edge area interconnecting said top and bottom surfaces, said thin film of a eutectic being situate on and contiguous with at least a portion of one of the major substrate surfaces and having upper and lower substantially parallel and generally planar major opposed surfaces, the perpendicular distance between said upper and lower surfaces being the thickness of said film, said eutectic having a pattern of a periodic geometric array of a first type lamella and at least a second type lamella located between lamella of said first type, said lamellae extending between and terminating in said upper and lower surfaces and being substantially perpendicular to the planes of said upper and lower surfaces, said lamellae having dissimilar X-ray absorption coefficients, the distance from the centerline of one lamella to the next closest lamella of the same type in said array being the interlamellar spacing, and the width of the narrowest of said types of lamellae being the minimum feature size;

(b) interposing said mask between a source of X-radiation and said X-radiation sensitive material;

(c) irradiating said mask with X-radiation, said X-radiation passing preferentially through the lamellae of said mask having the smallest X-radiation absorption coefficient thereby preferentially exposing said X-radiation sensitive material; and

(d) developing said X-radiation sensitive material replicating thereby the pattern of said mask in said X-radiation sensitive material.

4,349,622

PHOTOGRAPHIC SILVER HALIDE EMULSION COMPRISING EPITAXIAL COMPOSITE SILVER HALIDE CRYSTALS, SILVER IODOBROMIDE EMULSION AND PROCESS FOR PREPARING THE SAME

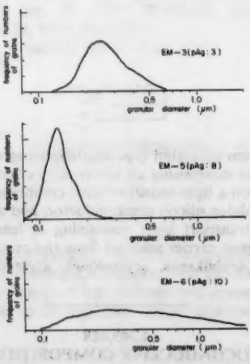
Takeo Koitabashi; Syozi Matsuzaka, and Tashifumi Iijima, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 29, 1980, Ser. No. 154,442

Claims priority, application Japan, Jun. 1, 1979, 54/69243; Jul. 19, 1979, 54/92328; Feb. 7, 1980, 55/14367

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **11 Claims**



1. A photographic silver halide emulsion which comprises composite silver halide crystals consisting essentially of multi-faceted silver iodobromide crystals containing 15–40 mole % of silver iodide and silver halide crystals containing not more than 10 mole % of silver iodide, said silver halide crystals being combined as epitaxial silver halide crystals with said multi-faceted silver iodobromide crystals through epitaxial junction, at least half of the facetes of said multi-faceted silver iodobromide crystals being substantially free of said epitaxial silver

halide crystals, and the amount of said epitaxial silver halide being limited to not more than 75 mole % based on the total silver halide forming said composite silver halide crystals.

4,349,623

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Shinpei Ikenoue; Hiroyuki Mifune, and Yoshiharu Fuseya, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1980, Ser. No. 159,569
Claims priority, application Japan, Jun. 15, 1979, 54/76160
Int. Cl.³ G03C 1/28
U.S. Cl. 430—600 25 Claims

1. In a process for producing a silver halide photographic material comprising the steps of

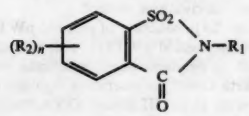
(1) a precipitating step of silver halide grains to obtain a silver halide emulsion;

(2) a physical ripening step of the silver halide grains of the silver halide emulsion;

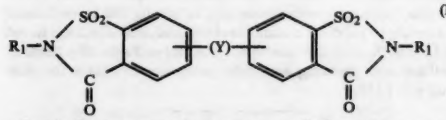
(3) a chemical ripening step of the physical-ripened silver halide grains of the silver halide emulsion;

(4) an adding step of additives to the chemical-ripened silver halide emulsion; and

(5) an coating step of the silver halide emulsion on a support, characterized in that step (3) is conducted in the presence of a noble metal sensitizer and for a compound represented by the formula (I) or (II)



(I)



(II)

wherein R_1 represents hydrogen, an alkali metal ion, or an ammonium ion; R_2 represents an alkyl group, an alkoxy group, an aryloxy group, an acyl group, an amino group, a substituted amino group, a halogen atom, an acyloxy group, an acylamino group, a carbamoyl group, a nitro group, an aryl group, an allyl group, a sulfo group or a carboxy group; Y represents a divalent linking group; and n is 0, 1, or 2.

4,349,624

PHOTOGRAPHIC SILVER HALIDE MATERIAL

Johannes Sobel; Wolfgang Himmelmann, both of Leverkusen, and Peter Bergthaller, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,210
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943806
Int. Cl.³ G03C 1/30
U.S. Cl. 430—622 6 Claims

1. A photographic light-sensitive silver halide material comprising a support and at least a gelatin-containing layer hardened with a reaction product (C) which is an amine salt containing at least 2 vinyl sulfonyl groups and which is obtained by reacting in solution at a temperature ranging from room-temperature to the reflux-temperature of the solution of a compound containing at least 3 vinyl sulfonyl groups in the molecule with an amine or an amine salt, whereby said compound corresponds to the following general formulae:

$$R(SO_2—CH=CH_2)_n \quad (A)$$

in which:

R represents an n-functional aliphatic hydrocarbon radical which may be substituted, an n-functional aromatic hydrocarbon radical which may be substituted, an n-functional cycloalkyl radical which may be substituted or an n-functional heterocyclic radical which may be substituted and n is an integer of from 3 to 6, and said amine or amine salt corresponds to the following general formulae:

(B)

in the form of the free amine or the corresponding amine salt in which:

R_1 and R_2 may be the same or different and represent a hydrogen atom or an unsubstituted lower alkyl group,

R_3 represents an unsubstituted alkyl group, an unsubstituted aminoalkyl group, an unsubstituted cycloaliphatic radical, an unsubstituted aromatic radical or a 5-membered or 6-membered unsubstituted heterocyclic ring which may be attached to the nitrogen atom of compound (B) either directly or through a carbon-containing group,

or R_2 and R_3 together represent the atoms required to complete an unsubstituted heterocyclic ring system which, in addition to nitrogen atom, may contain an oxygen atom or another nitrogen atom.

4,349,625

METHOD FOR ASSAYING FATTY ACIDS

Tsutomu Okada, Yokohama; Tadashi Hishida, Tokyo, and Minoru Muramatsu, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 30, 1980, Ser. No. 145,035
Claims priority, application Japan, May 25, 1979, 54-64651; Sep. 25, 1979, 54-122961
Int. Cl.³ C12Q 1/28, 1/00, 1/48, 1/32
U.S. Cl. 435—4 9 Claims

1. In a method for assaying fatty acids in an aqueous system containing albumin free fatty acid in a sample by reacting, the free fatty acid with adenosine triphosphate in the presence of coenzyme A catalyzed by acyl-CoA synthetase thereby forming AMP and acyl-CoA and measuring the acyl-CoA or AMP formed, the improvement comprising: adding from 0.01 to 5 mole percent, based on said fatty acid, of a water soluble salt of a dibasic fatty acid having 10 to 18 carbon atoms or a salt selected from the group consisting of the sodium, potassium and ammonium salts of benzene sulfonic acid, p-toluene-sulfonic acid, p-ethylbenzenesulfonic acid, p-n-propylbenzenesulfonic acid, p-n-amylbenzenesulfonic acid, 2,4-dimethylbenzenesulfonic acid or 2,5-dimethylbenzenesulfonic acid to the aqueous assay medium.

4,349,626

METHOD OF DETECTING *PSEUDOMONAS AERUGINOSA* INFECTIONS UTILIZING SELECTED KETONE AND/OR SULFUR METABOLITES

John N. Labows, Horsham; James G. Kostelc, Glenside, and Kenneth J. McGinley, Philadelphia, all of Pa., assignors to The Monell Chemical Senses Center, Philadelphia, Pa.

Filed Oct. 28, 1980, Ser. No. 201,565
Int. Cl.³ C12Q 1/10; C12R 1/385
U.S. Cl. 435—38 30 Claims

1. A method of diagnosing the nature and extent of a suspected *Pseudomonas aeruginosa* infection, comprising:

(a) collecting from a patient suspected of having such infection, a sample of material associated with the site of such suspected infection;

(b) collecting volatile compounds released from said sample to provide a sample headspace;

(c) analyzing said sample headspace; and

(d) determining the concentration of least one methyl-ketone

contained in said headspace, said methyl ketone having the formula:

$$CH_3(CH_2)_x-\overset{O}{\overset{\|}{C}}-CH_3$$

where X is 1, 2, 4, 6, 8 or 10 to thereby diagnose the nature and extent of such infection.

4,349,627

PROCESS FOR PRODUCING L-TRYPTOPHAN OR DERIVATIVES THEREOF USING A MICROORGANISM

Akio Mimura; Yasuyuki Takahashi; Katsumi Yuasa, all of Fuji, and Mitsuru Shibukawa, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1981, Ser. No. 274,566
Claims priority, application Japan, Jun. 17, 1980, 55-80918
Int. Cl.³ C12P *13/22;* C12N *1/20*
U.S. Cl. 435—108 4 Claims

1. A process for producing L-tryptophan or a derivative thereof, wherein an indole compound is reacted with serine, or with pyruvic acid and/or its salt and ammonium ion, in the presence of a culture or treated culture of the genus Enterobacter microorganism Enterobacter SP. AST 49-4 having the FERM designation FERM-P 5543.

4,349,628

FERMENTATION PROCESS FOR THE MANUFACTURE OF AN ORGANIC COMPOUND

Martin English, Ashtead; David P. Pym, Tadworth, and Lindsay G. Dawson, Loughborough, all of England, assignors to Kins Developments Limited, London, England

Filed Jul. 15, 1980, Ser. No. 169,186
Claims priority, application United Kingdom, Jul. 18, 1979, 7924957; May 19, 1980, 8016470
Int. Cl.³ C12P *7/06;* B01D *3/42;* C12M *1/02*
U.S. Cl. 435—161 28 Claims

1. A process for the manufacture of ethanol or a like volatile organic compound which process comprises the steps of fermenting in a fermenter a carbohydrate with a micro-organism which will convert the carbohydrate into ethanol or a like volatile organic compound, continuously transferring a portion of the fermentation medium, through a heat exchanger where it receives a supply of heat which raises the temperature of the medium to a temperature which is below that at which the micro-organism is rapidly rendered inactive, but which is such that subsequent evaporation of ethanol or the like volatile organic compound at a reduced pressure will be facilitated, to a separator where ethanol or the like volatile organic compound is evaporated from the fermentation medium at a temperature which is not deleterious to the micro-organism by subjecting the fermentation medium to a reduced pressure and recycling part or all of the remaining fermentation medium to the fermenter, the rate of the circulation of fermentation medium from the fermenter to the separator and back being such that the amount of ethanol or like volatile organic compound in the fermentation medium in the fermenter is kept sufficiently low so as not to detrimentally affect the rate of fermentation, subjecting the vapour issuing from the separator to a fractional distillation column containing a low pressure drop contacting medium under reduced pressure thereby to separate the components of the vapour, compressing the vapour issuing from the top of the fractionation distillation column thereby raising its temperature, recondensing the compressed vapour in a heat transfer system to provide heat, and using said heat both for evaporating ethanol or the like volatile organic compound from the fermentation medium in the separator and for said frictional distillation of the vapour.

4,349,629

PLASMID VECTORS, PRODUCTION AND USE THEREOF

Norman H. Carey, Chinnor; John S. Emtage, Amersham Hill; William C. A. Tacon, High Wycombe, all of England, and Robert A. Hallewell, San Francisco, Calif., assignors to G.D. Searle & Co., Skokie, Ill.

Filed May 29, 1980, Ser. No. 154,489
Claims priority, application United Kingdom, Jun. 1, 1979, 7919245
Int. Cl.³ C12N *15/00*
U.S. Cl. 435—172 14 Claims

1. A plasmid having an insertion site for a eukaryotic DNA fragment adjacent to a trp bacterial promoter, trp E gene and trp D gene, said insertion site being downstream from a prokaryotic ribosome binding site and the trp initiator codon such that the trp bacterial promoter controls transcription and translation of an inserted DNA fragment; the plasmid having a molecular length of 9866 bp; a Hind III site; a Bam I site 346 bp from the Hind III; a Sal I site 275 bp from the Bam I; an Eco RI site 3709 bp from the Sal I; a second Hind III site 31 bp from the Eco RI; a Hpa I site 305 bp from the second Hind III; a second Hpa I site 3250 bp from the first Hpa I and 1950 bp from the first Hind III; the trp promoter, the E gene and part of the D gene in the portion of 1950 bp between the second Hpa I and the first Hind III sites; a gene for tetracycline resistance immediately following the first Hind III site; and a gene for ampicillin resistance in the portion of 3709 bp between the Sal I and the Eco RI sites, the plasmid being referred to as pEH3; and the nic⁻ derivatives thereof.

14. A process for the production of plasmid pWT131 which comprises restricting plasmid pWT121 with restriction endonuclease Hind III to produce linear molecule, treating the linear molecule with DNA polymerase I, ligating the treated linear molecule with Hind III linker DNA, restricting the ligated molecule with restriction endonuclease Hind III to produce a second linear molecule, religating the second linear molecule to produce a combinant plasmid, transforming *E. coli* K12 HB101 with the combinant plasmid and selecting those *E. coli* colonies showing ampicillin resistance to obtain the plasmid pWT131.

4,349,630

HEAT-RESISTANT WATER SOLUBLE UROKINASE DERIVATIVE

Alexandr V. Maximenko, ulitsa Baltiiskaya, 10, korpus 3, kv. 144.; Vladimir P. Torchilin, Rostovskaya naberezhnaya, 1, kv. 90.; Vladimir N. Smirnov, Juzhinsky pereulok, 3, kv. 5., and Evgeny I. Chazov, Petroverigsky pereulok, 10., all of Moscow, U.S.S.R.

Filed Aug. 27, 1980, Ser. No. 183,093
Claims priority, application U.S.S.R., Sep. 28, 1979, 2821712
Int. Cl.³ C12N *9/72, 11/08, 9/96*
U.S. Cl. 435—180 4 Claims

1. A heat-resistant water soluble derivative of urokinase comprising urokinase covalently bonded to a copolymer of acrylamide and acrylic acid having a molecular weight of from 10,000 to 200,000 conventional units and a content of acrylic acid of from 1 to 20%, said derivative containing 15 to 35% of urokinase and having esterase and amidolytic activity of from 10 to 80%.

4,349,631

PROCESS FOR PRODUCING HEAT-RESISTANT ACETATE KINASE

Masao Kagayama, Uji, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Nov. 21, 1980, Ser. No. 209,096
Claims priority, application Japan, Nov. 22, 1979, 54-151660
Int. Cl.³ C12N *9/12;* C12R *1/07*
U.S. Cl. 435—194 11 Claims

1. A process for producing a heat-resistant acetate kinase

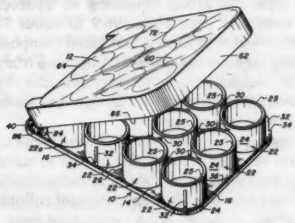
that comprises culturing cells of Strain FERM-P No. 5141, a new strain of thermophilic *Bacillus stearothermophilus* having an appreciably elongated cell, and collecting a heat-resistant acetate kinase from the culture obtained.

4,349,632

TISSUE CULTURE CLUSTER DISH

George F. Lyman, Rocky Point, Me., and Alan Lowry, Canton, Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Mar. 17, 1981, Ser. No. 244,731
Int. Cl.³ C12M *3/00*
U.S. Cl. 435—284 10 Claims



1. A tissue culture cluster dish comprising

a base having a plurality of wells joined in a unitary structure for receiving materials, said wells having closed bottoms and upstanding side walls,

a rim structure forming the periphery of the base for supporting the base on a surface with the bottom of the wells raised above said surface,

a cover having a top closure wall and a peripheral skirt, said cover being adapted to be supported in a first position with the closure wall spaced just above the top edges of the side walls of the wells to permit the interior of the wells to be exposed to the ambient atmosphere,

and support means formed as part of the base for engaging the skirt of the cover for supporting the cover on the base in a second position wherein the cover is lifted at an angle with respect to the base to permit access to the wells by a pipette or other instrument while preventing contamination of the wells by airborne substances.

4,349,633

PROCESS OF MICROBIAL EXTRACTION OF HYDROCARBONS FROM OIL SANDS

Howard E. Worne, 205 Sunny Jim Dr., Medford, N.J. 08055, and Irving Rabinovitch, 5762 Leger St., Cote St. Luc, Quebec H4W 2E7, Canada

Filed Nov. 10, 1980, Ser. No. 205,153
Int. Cl.³ C10G *1/00*
U.S. Cl. 435—281 16 Claims

1. A process for the separation of hydrocarbon residues from oil and tar sands which comprises contacting the sands under aerobic conditions with an aqueous medium containing hydrocarbon-metabolizing microorganisms capable of producing oxidase enzymes or oxygenase enzymes or both, in the presence of an added surfactant in an amount sufficient to provide surface tension of at most about 40 dynes/cm and in the presence of oxygen in an amount sufficient to ensure activity of said enzymes, whereby hydrocarbon residues are released from the sands.

4,349,634

METHOD OF PREPARING PHOTOCHROMIC GLASS

Harry Owen, Parbold, and Edric Ellis, Ormskirk, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Aug. 11, 1980, Ser. No. 176,838
Claims priority, application United Kingdom, Aug. 9, 1979, 7927751
Int. Cl.³ C03B *32/00;* C03C *3/26, 3/30*
U.S. Cl. 501—13 15 Claims

1. A process for producing a photochromic glass containing silver halide and which has a brown colouration in its darkened state, which process comprises (a) forming a batch comprising tin or a tin compound in an amount which will produce a glass which will exhibit a brown colouration in its darkened state, together with those glass forming components which, in the absence of tin or the said tin compound and when subjected to steps (b) to (f) below, will produce a photochromic glass having a grey colouration in its darkened state, (b) melting the batch to form a molten glass, (c) refining the molten glass, (d) conditioning the molten glass to bring it into a state suitable for forming into articles, (e) forming the molten glass into articles, and (f) subjecting the formed articles to a heat-treatment which will develop the photochromic properties of the glass, steps (b) to (f) being performed under conditions which, in the absence of tin or the said tin compound, will produce a glass having a grey colouration in its darkened state.

13. A photochromic glass having silver halide crystals and tin dispersed throughout the glass, the glass having in its darkened state a brown colouration which is described in accordance with the Hunter L,a,b Colour Scale System by the rectangular region having corners defined by the (a,b) co-ordinates: (5,1), (1,5), (12,16) and (16,12), the ½ OD FT of the glass being 120 seconds or less, the glass being an alumino-phosphate glass having silver halide crystals dispersed throughout the glass and comprising, as non-photochromic components in weight percentages:

SiO_2	8.5 to 25%
Al_2O_3	13 to 36.5%
P_2O_5	7.5 to 33.5%
B_2O_3	7 to 28%
R_2O	7 to 20.5%

where R_2O represents one or more of Na_2O, K_2O and Li_2O, the maximum content of Li_2O being 5%; the amount of SiO_2 being not less than 16% when the B_2O_3 content is less than 8%; and, as photochromic components, expressed as weight percentages over and above the 100% total of all the nonphotochromic components of the glass:

silver expressed as Ag_2O	not less than 0.05%
Cl + Br	0.20 to 2%,

the finished glass composition further including tin.

4,349,635

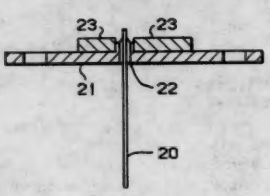
LOWER TEMPERATURE GLASS AND HERMETIC SEAL MEANS AND METHOD

Earl K. Davis, Tempe; Rafael Landron, Phoenix, and Scot W. Taylor, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1981, Ser. No. 315,102
Int. Cl.³ C03C *7/02, 3/08*
U.S. Cl. 501—15 4 Claims

1. A lead-free glass plus alumina ceramic sealing material

consisting essentially of a composition by weight percent in the range of:



Ingredients	Composition Range
SiO_2	34–50
Al_2O_3	2–25
K_2O	2–6
Na_2O	4–9
Li_2O	2–6
CaO	0–4
ZnO	4–12
BaO	1–5
TiO_2	2–6
B_2O_3	11–21

3. A lead-free sealing glass which is resistant to reduction when fired in reducing atmospheres, wherein said lead-free sealing glass has an average coefficient of thermal expansion between 25° C. and 300° C. in the range $83-91\times10^{7}$ per °C., consisting essentially of ingredients by weight percent in the range of:

Ingredients	Composition Range
SiO_2	43–47
Al_2O_3	7–11
K_2O	3–5
Na_2O	6–8
Li_2O	3–5
CaO	1–2
ZnO	7–10
BaO	1–3
TiO_2	3–5
B_2O_3	5–20

4,349,636

METHOD FOR INCREASING THE DUCTILITY AND CONDUCTIVITY OF REFRACTORY CRYSTALS

Fred W. Vahldiek, 5851 Barrett Dr., Dayton, Ohio 45431

Filed May 14, 1981, Ser. No. 263,665
Int. Cl.³ C04B *35/52, 35/58*
U.S. Cl. 501—87 **4 Claims**

1. A process for imparting ductility and increased electrical conductivity to a refractory single crystal which comprises (A) forming a stoichiometrically proportioned specimen of a refractory single crystal; (B) pre-pressing said specimen within an enclosed silver chloride environment at room temperature and a pressure of about 200 atmospheres; (C) placing said pre-pressed specimen enclosed in said silver chloride environment into a pressure cell; (D) compressing said specimen and silver chloride environment to a pressure ranging from about 5,000 to 25,000 atmospheres at a temperature of about 22° C.; and (E) recovering a compressed specimen with a compositional content of less than stoichiometry.

4,349,637

ALUMINA BINDER FOR FIBER CONTAINING ALUMINA

Patrick M. Miedaner, Blue Bell, Pa., and Chhattar S. Kucheria, Grand Island, N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Filed Apr. 21, 1980, Ser. No. 142,271
Int. Cl.³ C04B *35/10*
U.S. Cl. 501—126 **9 Claims**

4. A thickened composition comprising from about 10 to about 35 weight percent fibers which comprise alumina, and the balance being the binder composition of claim 1.

6. A process for manufacturing a thickened ceramic binder composition which comprises:

(a) blending together ingredients comprising from about 3 to about 22 weight percent of colloidal alumina, from about 0.1 to about 0.5 weight percent of an inorganic acid selected from the group consisting of hydrochloric and nitric acids and from about 96.9 to about 77.5 weight percent of water to form a first blend component;

(b) blending together ingredients comprising from about 9 to about 60 weight percent of aluminum chlorhydrate and from about 40 to about 91 weight percent water to form a second blend component; and

(c) blending together the first and second blend components at a ratio between 7:1 and 12:1 of first to second component to form a thickened binder composition comprising: from about 3 to about 20 weight percent colloidal alumina, from about 1 to about 8 weight percent aluminum chlorhydrate, from about 0.1 to about 0.4 weight percent of an inorganic acid selected from the group consisting of hydrochloric and nitric acids and from about 75 to about 95 weight percent water, at least 95 weight percent of the solids in said composition being alumina or solids which convert to alumina upon calcining.

4,349,638

PROCESS FOR THE PREPARATION OF FOAMS CHARACTERIZED BY ISOCYANURATE, AND/OR URETHANE LINKAGES INVOLVING THE USE OF ALKALI METAL AMMONIUM CARBOXYLATE CATALYSTS

Thirumurti Narayan, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 2, 1981, Ser. No. 317,148
Int. Cl.³ C08J *9/14*; C08G *18/14, 18/22*
U.S. Cl. 521—125 **12 Claims**

1. A process for the preparation of a cellular foam characterized by isocyanurate linkages which comprises reacting an organic polyisocyanate in the presence of a blowing agent and a catalytically sufficient amount of an alkali metal ammonium carboxylate consisting of the reaction product of a tertiary amine with an alkali metal acid salt of a polycarboxylic acid.

4,349,639

METHOD OF MAKING AND THE COMPOSITION FOR AN INITIALLY ERASABLE INK FOR A BALL POINT WRITING INSTRUMENT

Frank A. Muller, West Los Angeles, Calif., assignor to Scripto, Inc., Doraville, Ga.

Filed Mar. 26, 1981, Ser. No. 247,982
Int. Cl.³ C09D *11/18, 11/10, 11/08*
U.S. Cl. 523—161 **18 Claims**

1. The method of making an ink composition which is characterized by initial erasability by ordinary pencil erasers of a trace thereof when applied by a ball-point writing instrument to an absorbent paper-like writing surface and which trace thereafter develops permanence, said method comprising the steps of:

(a) providing a pre-pigmented elastomer component in which pigment is substantially homogeneously distributed

throughout and aggregated onto molecular chains of elastomer component;

(b) dispersing the pre-pigmented elastomer component in a solvent system, the solvent system being present in amount sufficient to provide an ink composition having a viscosity in the range of $1–4\times10^6$ cps and comprising a volatile component having a boiling point less than about 180° C. and which contributes to initial erasability of an applied trace of the ink composition and an essentially non-volatile component which contributes to development of permanence of the applied trace; and

(c) controlling initial erasability of the ink composition and capability of subsequently developing permanence when applied as a trace to the absorbent writing surface with the ball-point writing instrument by selecting, for the elastomer component of step (a), elastomeric materials which exhibit predetermined molecular weight distribution over a wide molecular weight range and by milling the pigment into the elastomer component in the absence of the solvent system to provide the pre-pigmented elastomer component of step (a), and by selecting, for the essentially non-volatile component of step (b), a liquid having a boiling point in the range 180°–300° C. and a viscosity in the range 1–15 cps.

4,349,640

INHIBITION OF POLYURETHANE HARDENING

C. Neil Keeney, Chesterfield, Mo.; Paul W. May, Jr., Fairview Heights, and Albert W. Morgan, Collinsville, both of Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 14, 1978, Ser. No. 942,231

Int. Cl.³ C08K *5/12*

U.S. Cl. 524—294 **20 Claims**

1. An elastomeric polyurethane composition prepared by subjecting to polyurethane-forming reaction conditions an elastomeric polyurethane-forming reactant mixture comprising (a) diisocyanate-capped, essentially linear polyester or polyether, (b) polyol suitable for cross-linking of said polyester or polyether to provide an elastomeric polyurethane, said polyol having more than two reactive hydroxyl groups, (c) polyurethane-plasticizing carboxylate having a molecular weight from about 200 to about 1,000 and at least two monocyclic aryl radicals per molecule and, based on the weight of said carboxylate, from about 0.1% to about 5% (d) glycol having a molecular weight from 62 to about 500.

4,349,641

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

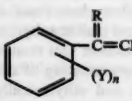
Division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Jun. 16, 1980, Ser. No. 159,744

Int. Cl.³ C08L *33/26, 39/08*

U.S. Cl. 524—458 **6 Claims**

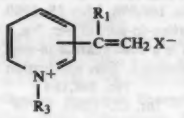
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 1.0 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (1) being a monomer having the formula

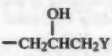


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, and said prepolymer (2) being the addition polymerization product of

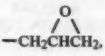
(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein R_1 is hydrogen or methyl, R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is hydroxyl or halogen,



and $-(CH_2CH_2O)_nH$ where n is an integer 1 or more and X^- is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the gaft copolymer particles being from about 2 parts to about 10 parts by weight for each 100 parts by weight of monomer (1) employed.

4,349,642

ULTRAVIOLET RADIATION AND IMPACT RESISTANT THERMOPLASTIC BLENDS

Leroy J. Memering, and Ervin G. Pritchett, both of Cincinnati, Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Filed May 4, 1981, Ser. No. 259,887

Int. Cl.³ C08K *3/22*

U.S. Cl. 524—524 **26 Claims**

1. Compatibilized polymer triblends which comprise:

a. from about 5 to about 40 pph of at least one resin selected from the group consisting of:

i. a copolymer of ethylene and vinyl acetate containing from about 25 percent to about 75 percent vinyl acetate, and

ii. a terpolymer of ethylene, vinyl acetate and the theoretical monomer vinyl alcohol containing from about 20 percent to about 80 percent ethylene, from about 18 percent to about 60 percent vinyl acetate and from about 2 percent to about 20 percent vinyl alcohol;

b. from about 50 pph to about 95 pph of a copolymer of styrene and acrylonitrile containing from about 15 percent to about 40 percent acrylonitrile;

c. from about 0.1 pph to about 40 pph of a chlorinated polyethylene; and,

d. from about 2 to about 40 pph titania particulate, said titania particulate imparting to said triblend resistance to degradation by solar ultraviolet radiation but without significant loss in impact resistance when compared with the impact resistance of said triblend to which no titania particulate has been added.

4,349,643

COATING COMPOSITION ADAPTED FOR TRANSFER COATING DURING REACTION INJECTION MOLDING CONTAINING A POLYURETHANE CATALYST

Gulam Mohiuddin, Brighton, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 149,996, May 15, 1980, Pat. No. 4,282,285, which is a continuation-in-part of Ser. No. 87,768, Oct. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 38,505, May 14, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 248,184

Int. Cl.³ C08L 75/04

U.S. Cl. 524—560 4 Claims

1. A paint composition comprising a polymeric resin selected from the group consisting of acrylic polymers and completely reacted polyurethane polymers, said paint composition adapted for the transfer coating of polyurethane parts during a reaction injection molding operation, said paint composition containing from 0.05 to 10% by weight of the coating of a polyurethane catalyst, said catalyst acting as a catalyst for said polyurethane part but not for said paint composition.

4,349,644

MELT-BLENDED RESIN COMPOSITION OF HYDROLYZED ETHYLENE/VINYL ACETATE COPOLYMERS

Teruo Iwanami, Ibaraki; Hiroshi Takida, Takatsuki, and Yukio Fujita, Otsu, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1981, Ser. No. 250,411

Int. Cl.³ C08L 23/26, 29/02

U.S. Cl. 525—57 1 Claim

1. A melt-blended resin composition comprising a mixture of at least two kinds of hydrolyzed ethylene-vinyl acetate copolymers having different ethylene contents, each of the hydrolyzed ethylene-vinyl acetate copolymers having an ethylene content of 20 to 55% by mole, a degree of hydrolysis in vinyl acetate component of at least 80% by mole and a melt tension of at least 0.1 g., the fusion curve of the mixture measured by a Differential Scanning Calorimeter indicating substantially single peak, and the hydrolyzed ethylene-vinyl acetate copolymer A_1 included in the largest amount and the hydrolyzed ethylene-vinyl acetate copolymer A_2 included in the second largest amount among the hydrolyzed copolymers constituting the composition having the correlation between them that the proportion of the hydrolyzed copolymer A_1 to the hydrolyzed copolymer A_2 falls within the range of 95:5 to 50:50 by weight and a difference in ethylene content between the hydrolyzed copolymer A_1 and the hydrolyzed copolymer A_2 is at least 3% by mole.

4,349,645

POWDERED BLEND OF EPOXY RESIN AND ANHYDRIDE CONTAINING HINDERED NITROGEN-CONTAINING COMPOUND

Allen L. Griggs, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 5, 1981, Ser. No. 290,382

Int. Cl.³ C08G 59/68

U.S. Cl. 525—120 21 Claims

1. Powder useful for applying protective coatings comprising a blend of (a) a major proportion by weight of polyglycidyl ether of bisphenol A having a Durrans' softening point between 60° and 130° C., (b) between 50% and 150% of a stoichiometric amount of trimellitic anhydride, and (c) a small amount of catalyst, wherein the improvement comprises:

the blend contains by weight of the polyglycidyl ether 0.1 to 5% of at least one hindered nitrogen-containing compound which

(1) has an aqueous pKa greater than 3.5,

(2) has a boiling point above 125° C., and

(3) is soluble in the polyglycidyl ether.

4,349,646

WATER INSOLUBLE DISINFECTANT COMPOSITION

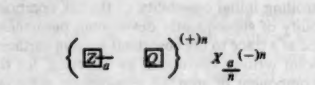
Ron Nudel, Brooklyn; Gilbert E. Janauer, Binghamton; Eugene E. Schrier, Vestal, and Ilona W. Figura, White Plains, all of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Filed Jan. 31, 1980, Ser. No. 117,062

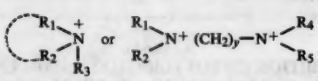
Int. Cl.³ C08F 8/24, 8/32

U.S. Cl. 525—256 8 Claims

1. A water insoluble disinfectant composition comprising a quaternary ammonium salt of the formula.



a is a positive integer, n is an integer of 1–6, Q is a water insoluble resin of microporous or macroporous structure selected from the group consisting of polystyrene crosslinked resins having methylene moieties attached to the backbone thereof, and methylated polymethylmethocrylate resins, X is the anion of any physiologically acceptable salts, and Z is



wherein: R_1 and R_2 are selected from the group consisting of straight or branch chain lower alkyl of one to eight carbon atoms, straight or branch chain lower alkenyl of two to eight carbon atoms, lower cycloalkyl of three to six carbon atoms and R_3, and R_1 and R_2 when taken together with the nitrogen to which they are attached, form a saturated or unsaturated heterocycle having five to seven carbon atoms in the ring, R_3 is straight or branch chain midalkyl of ten to sixteen carbon atoms, phenyl, halo or lower alkyl substituted phenyl, naphthyl lower alkyl and halo or lower alkyl substituted naphthyl lower alkyl wherein said lower alkyl moieties are of one to five carbon atoms and are substituted on from one to five positions on the phenyl nucleus and from one to seven positions on the naphthyl nucleus, R_4–R_7 are selected from the same group of values as R_1–R_3, y is a positive integer of 1–20, provided that where R_1, N, and R_5 are joined to form a fully unsaturated heterocycle, R_3 is absent, and Z is bonded to the methylene moieties.

4,349,647

RESIST MATERIAL FOR MICRO-FABRICATION

Kohtaro Nagasawa, Tokyo; Hideo Ochi, Kawasaki; Fujio Tanaka, Koshigaya, and Yumi Shibata, Tokyo, all of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 926,067, Jul. 19, 1978, Pat. No. 4,273,858. This application Feb. 5, 1981, Ser. No. 232,064

Int. Cl.³ C08F 8/46

U.S. Cl. 525—285 9 Claims

1. A resist material for microfabrication consisting essentially of a polymer having a backbone formed of monomer units selected from the group consisting of vinyl acetate, vinyl propionate, vinyl chloride, methyl vinyl ketone, vinyl isocyanate, vinyl pyrrolidone acrylonitrile, ethyleneoxide, alkyl acrylate, alkyl methacrylate, butadiene, isoprene, acrylamide, styrene, itaconic acid and maleic anhydride wherein about 1 to 100 percent of said monomer unit contain functional group(s) selected from the group consisting of amino groups, hydroxyl groups, epoxy groups and ethylenically unsaturated bonds, bonded to an α,β-unsaturated dicarboxylic moiety of the formula (I)

$$ROOCH{=}CHCO{-} \quad (I)$$

wherein R represents a hydrogen atom an alkyl group, an alkenyl group, an aryl group or an arakyl group, the resist material being substantially non-light sensitive, but curable electromagnetic radiation with the wave length of less than about 3,000 A.

4,349,648

CATALYST COMPOSITION FOR COPOLYMERIZING ETHYLENE

Robert J. Jorgensen, Dunbar, W. Va.; George L. Goeke, and Frederick J. Karol, both of Belle Mead, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 31, 1981, Ser. No. 288,806

Int. Cl.³ C08F *2/34, 10/02*

U.S. Cl. 526—125 **18 Claims**

1. A continuous process for producing ethylene copolymers containing at least 90 mol percent of ethylene and no more than 10 mol percent of one or more alpha olefins containing from 3 to 8 carbon atoms, said copolymers being produced in granular form and having a density of from 0.91 g/cm³ to 0.94 g/cm³,

which comprises contacting a mixture of ethylene and at least one alpha olefin containing from 3 to 8 carbon atoms, at a temperature of from 30° C. to 105° C. and a pressure no greater than 1000 psi, in a gas phase reaction zone, with particles of a catalyst system comprising a precursor composition having the formula:

$$Mg_mTi(OR)_nX_p[ED]_q$$

wherein R is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms, or COR′ wherein R′ is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms,

X is selected from the group consisting of Cl, Br, I, and mixtures thereof,

ED is an organic electron donor compound selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones,

m is 0.5 to 56,

n is 0, 1 or 2,

p is 2 to 116, and

q is 2 to 85,

said precursor composition being diluted with an inert carrier material, and being completely activated in the reaction zone with a mixture of a dihydrocarbyl aluminum halide compound and a trihydrocarbyl aluminum compounded wherein the molar ratio of dihydrocarbyl aluminum halide compound to trihydrocarbyl aluminum compound is maintained at from 4:1 to 20:1, said dihydrocarbyl aluminum halide compound and said trihydrocarbyl aluminum compound being employed in an amount such as to provide a total aluminum:titanium molar ratio in said reaction zone of from 10:1 to 400:1,

said dihydrocarbyl aluminum halide compound having the formula:

$$R''_2AlX$$

wherein R″ is a saturated hydrocarbon radical containing from 1 to 14 carbon atoms or OR‴, wherein R‴ is a saturated hydrocarbon radical containing from 1 to 14 carbon atoms,

and said trihydrocarbyl aluminum compound having the formula:

$$R'''_3Al$$

wherein R‴ is a saturated hydrocarbon radical containing from 1 to 14 carbon atoms, and

X is selected from the group consisting of Cl, Br, I, and mixtures thereof.

4,349,649

PROCESS OF PREPARING COPOLYMERS OF BUTYL ACRYLATE AND 1-(α-ALKYL ACRYLATE)-1-TERT-BUTYL PEROXY ETHANES

Valery N. Pavljuchenko, prospekt Energetikov, 34, kv. 53; Zinaida M. Pessina, ulitsa Pskovskaya, 6, kv. 17; Elena D. Vasilieva, prospekt Lunacharskogo, 110, kv. 324, and Sergei S. Ivanchev, ulitsa Nalichnaya, 36/3, kv. 97, all of Leningrad, U.S.S.R.

PCT No. PCT/SU79/00015, § 371 Date Nov. 13, 1980, § 102(e) Date Nov. 6, 1980, PCT Pub. No. WO80/01916, PCT Pub. Date Sep. 18, 1980

PCT Filed Mar. 13, 1979, Ser. No. 212,703

Int. Cl.³ C08F *2/00, 220/10*

U.S. Cl. 526—234 **1 Claim**

1. A process of preparing copolymers of butyl acrylate and 1-(α-alkyl acrylate)-1-tert-butyl peroxy ethanes by means of emulsion copolymerization of butyl acrylate and 1-(α-alkyl acrylate)-1-tert-butyl peroxy ethanes in the presence of an initiating system wherein alkyl is 1–5 carbon atoms, characterized in that the initiating system consists of sodium metabisulfite in amount of from 0.008 to 1.640% of the total mass of monomers and a compound of the general formula $Na_xH_yS_zO_3$, where "x" is an integer of 1 or 2, "y" is zero or 1, "z" is an integer of 1 or 2, said compound being in amount of from 0.002 to 0.360% of the total mass of monomers.

4,349,650

POLYFLUOROALLYLOXY COMPOUNDS, THEIR PREPARATION AND COPOLYMERS THEREFROM

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,354, Mar. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 850,729, Nov. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 747,029, Dec. 2, 1976, abandoned. This application May 1, 1980, Ser. No. 145,760

Int. Cl.³ C08F *220/42, 228/00, 214/18, 220/22*

U.S. Cl. 526—243 **9 Claims**

1. A copolymer of a polyfluoroallyloxy compound having the formula

$$CF_2{=}CFCF_2OR_F$$

wherein

R_F is

$$-CFR^1CFQ \quad (i)$$
$$\quad\quad\; Y \quad Y'$$

wherein R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms; Q is $-SO_2F$, $-COF$, $-CN$ or $-CO_2R^4$ where R^4 is $-CH_3$ or $-C_2H_5$; Y and Y′, independently, are $-F$ or $-CF_3$ and only Y and Y′ can be $-CF_3$; or

(ii) $-CF(R^2)_2$

wherein R^2 is $-CF_2COF$, $-CF_2CN$, or $-CF_2CO_2R^4$ where R^4 is defined as above; or

$$-(CF_2CFO)_nR^3Q' \quad (iii)$$
$$\quad\quad\;\; Y$$

wherein R^3 is a linear perfluoroalkylene group of carbon content such that the moiety

$$-(CF_2CFO)_nR^3$$
$$\quad\quad|$$
$$\quad\quad Y$$

does not exceed 15 carbon atoms; Y is —F, or $—CF_3$; n is 1 to 4; and Q′ is defined as for Q above; and at least one ethylenically unsaturated monomer; said copolymer having a molecular weight sufficient to be molded into a shaped article.

4,349,651

RESINOUS COPOLYMER INSULATING COMPOSITIONS

James D. B. Smith, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1980, Ser. No. 174,329
Int. Cl.³ C08F 222/30, 224/00, 226/06
U.S. Cl. 526—263 3 Claims

1. A water soluble addition copolymer consisting of the uncatalyzed reaction product of: (1) a first component electron rich monomer selected from the group consisting of vinylimidazole, 2-methyl-1-vinylimidazole, vinyl carbazole, vinylindole, and their mixtures, said monomers having a high electron density at the pendant vinyl group, and (2) a second component monomer selected from the group consisting of maleic anhydride, fumaronitrile, tetracyanoethylene, maleimide, and their mixtures, where the average mol. ratio of first component monomer:second component monomer is about 1:1, said copolymer characterized as being spontaneously copolymerized, not containing any catalyst materials and having high mechanical and high voltage electrical insulating capability.

4,349,652

HIGH NITRILE RESINS CONTAINING MALEIC ANHYDRIDE

George S. Li, Aurora, and John F. Jones, Cuyahoga Falls, both of Ohio, assignors to Sohio, Ohio

Continuation of Ser. No. 27,956, Apr. 9, 1979, abandoned, which is a continuation of Ser. No. 944,109, Sep. 20, 1978, Pat. No. 4,197,263, which is a continuation of Ser. No. 806,577, Jun. 15, 1977, abandoned. This application Feb. 6, 1981, Ser. No. 232,075
Int. Cl.³ C08F 34/02, 222/04
U.S. Cl. 526—271 13 Claims

1. The polymeric composition resulting from the polymerization of 100 parts by weight of

(A) from 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from 1 to 30% by weight of maleic anhydride, and

(C) from 5 to 25% by weight of at least one member selected from the group consisting of

(1) an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\overset{|}{C}}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(2) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and

(3) vinyl acetate,

wherein the weight percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,349,653

HIGH NITRILE RESINS CONTAINING MALEIC ANHYDRIDE

George S. Li, Aurora, and John F. Jones, Cuyahoga Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 944,109, Sep. 20, 1978, Pat. No. 4,197,263, which is a continuation of Ser. No. 806,577, Jun. 15, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 27,955
Int. Cl.³ C08F 222/04
U.S. Cl. 526—272 6 Claims

1. The polymeric composition resulting from the polymerization of 100 parts by weight of

(A) from 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\overset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from 1 to 30% by weight of maleic anhydride, and

(C) from 5 to 25% by weight of at least one member selected from the group consisting of

(1) styrene or alpha-methyl styrene, and

(2) an alpha-olefin having the structure

$$CH_2=\underset{\displaystyle R''}{\overset{\displaystyle R'}{\overset{|}{\underset{|}{C}}}}$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

wherein the weight percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,349,654

POWDER COATING COMPOSITION

Tadayuki Ohmae; Teruhiko Murakami, and Yoshinori Kanno, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 3, 1980, Ser. No. 183,640
Claims priority, application Japan, Mar. 6, 1979, 54-26263
Int. Cl.³ C08F 24/00, 124/00; C08L 37/00
U.S. Cl. 526—273 5 Claims

1. A powder coating composition comprising (A) 100 parts by weight of a powdery hydration reaction product of a copolymer comprising 60 to 95% by weight of ethylene and 5 to 40% by weight of a glycidyl acrylate compound wherein 5 to 80% by mole of the epoxy groups of the copolymer are hydrated to produce 1, 2-dihydroxy groups, and (B) up to 100 parts by weight of powdery polyethylene.

4,349,655

WATER-DILUTABLE BINDERS CARRYING OXAZOLIDINE GROUPS

Wolfgang Leitner; Georg Pampouchidis, and Anton Bielkolm, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 29, 1980, Ser. No. 201,983
Claims priority, application Austria, Nov. 5, 1979, 7081/79
Int. Cl.³ C08G 18/00
U.S. Cl. 528—45 24 Claims

1. Binders water-dilutable upon neutralization with inorganic and/or organic acids, said binders being useful in cathod-

ically depositable coating compositions, comprising the reaction product of

(A) the monoadduct of (a) an N-hydroxyalkyloxazolidine, said N-hydroxyalkyloxazolidine being the reaction product of 1 mole of a dialkanolamine with from 0.8 to 1.3 moles of an organic compound containing a reactive carbonyl group and having up to 6 carbon atoms in an alkyl radical, said reaction occurring at a maximum temperature of 130° C., and (b) 1 mole of a diisocyanate, said adduct formation occurring by reaction at a maximum temperature of 30° C. until an NCO-value which corresponds to a monoadduct is obtained; and

(B) a hydroxyl group containing polymer; components (A) and (B) being adjusted to provide a final product having an amine value of from about 30–100 mg KOH/g.

4,349,656

THIODIETHANOL BASED POLYURETHANE ELASTOMERS HAVING IMPROVED DYNAMIC PROPERTIES AND METHOD FOR PRODUCTION THEREOF

Volker D. Arendt, Princeton, and Tsi T. Li, Milltown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 171,615, Jul. 23, 1980, Pat. No. 4,284,761. This application Jan. 26, 1981, Ser. No. 228,509

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—63 **8 Claims**

1. A polyurethane prepolymer comprising the reaction product of (A) a polyether-thioether copolymer glycol, represented by the formula:

$$H{-}OC_2H_4SC_2H_4{]} \quad [OC_4H_{8-y}OH$$

wherein the mole ratio of x/y ranges from about 45:55 to about 60:40 respectively, prepared by a process which comprises: (a) condensing, at a temperature of about 160°–205° C., in the presence of an acidic condensation catalyst, 1,4-butanediol with sufficient thiodiethanol to produce a trimer, represented by the formula:

$$HO{-}C_4H_8{-}O{-}C_2H_4SC_2H_4{-}O{-}C_4H_8{-}OH$$

(b) completing the condensation, under the same conditions, by the incremental addition to said trimer, of the remaining thiodiethanol at a rate corresponding essentially to the rate of removal of water of reaction therefrom, such that no significant excess of thiodiethanol is present in the reaction mixture at any given time; (c) extracting the product of (b) with water, at a ratio of polymeric diol to water between about 2/1 and 1/3; and (d) recovering the extracted copolymer glycol, with B) a diisocyanate at a mole ratio of about 1/1.5 to 1/2.5.

4,349,657

POLYURETHANE PROCESS

John A. Holloway, Sheffield Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 28, 1981, Ser. No. 306,065

Int. Cl.³ C08G *18/42*

U.S. Cl. 528—66 **8 Claims**

1. An improved method for preparing polyesterurethanes by first reacting together greater than 2 and less than 4 mols of p-phenylene diisocyanate with 1 mol of a hydroxyl-terminated polyester, derived from aliphatic glycols containing 2 to 8 carbon atoms and aliphatic dicarboxylic acids containing 4 to 10 carbon atoms and having a molecular weight from about 800 to about 1500, in a molten state at a temperature to react with the p-phenylene diisocyanate to form an isocyanate terminated polyesterurethane and then continuously mixing molten hydroxyl-terminated polyesters having a molecular weight of about 800 to 1500 derived from aliphatic glycols containing 2 to 8 carbon atoms and aliphatic dicarboxylic acids containing 4 to 10 carbon atoms when said isocyanate terminated polyesterurethane in a molten state at a temperature to form a polyesterurethane in a molar ratio so that substantially all of the isocyanate and hydroxyl groups are reacted together and the resulting polyesterurethane contains less than 0.05 mol of free isocyanate groups.

4,349,658

FLAME RETARDANT AROMATIC POLYESTER-CARBONATE COPOLYMER COMPOSITIONS

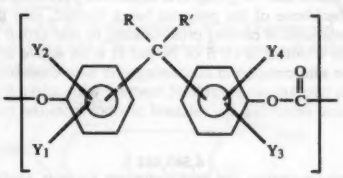
Victor Mark, Evansville, and Charles V. Hedges, Mount Vernon, both of Ind., assignors to General Electric Company, Mount Vernon, Ind.

Filed Dec. 31, 1980, Ser. No. 221,937

Int. Cl.³ C08G *63/64*

U.S. Cl. 528—176 **20 Claims**

1. A high molecular weight polyester-carbonate copolymer composition of matter having improved flame resistance comprising bisphenol ester units and bisphenol-carbonate units, said bisphenol-carbonate units having the general formula:



wherein R is selected from the group consisting of a fluorinated alkyl radical and a fluorinated aryl radical; R' is selected from the group consisting of fluorinated alkyl radical, fluorinated aryl radical, alkyl radical and hydrogen; and Y_1, Y_2, Y_3 and Y_4 are each independently selected from the group consisting of hydrogen, alkyl radical, chlorine and bromine.

4,349,659

PROCESS FOR PRODUCING AROMATIC POLYESTER

Yasuyuki Kato, Nilhama; Hiroaki Sugimoto, Nara, and Makoto Hanabata, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 2, 1980, Ser. No. 193,301

Claims priority, application Japan, Oct. 18, 1979, 54-134778

Int. Cl.³ C08G *63/02, 17/02*

U.S. Cl. 528—193 **7 Claims**

1. In a process for producing an aromatic polyester by reacting under application of heat (A) an aromatic dicarboxylic acid and/or an ester-forming derivative thereof, (B) an aromatic hydroxycarboxylic acid and/or an ester-forming derivative thereof, and (C) a dihydroxy aromatic compound produced by the method of alkali fusion and containing 4,4'-dihydroxydiphenyl as major constituent and/or an ester-forming derivative of said dihydroxy aromatic compound, the improvement which comprises employing, as said 4,4'-dihydroxydiphenyl, a 4,4'-dihydroxydiphenyl of such a quality that a solution of 1 part by weight of it dissolved in 100 parts by weight of a mixture comprising methanol and water in a weight ratio of 70:30 will show a pH of 6.6 to 7.4.

4,349,660

PROCESS FOR THE PRODUCTION OF AIR DRYING MODIFIED AMINO RESIN

Hannu J. Toivonnen, Espoo, Finland, assignor to Kemira Oy, Helsinki, Finland

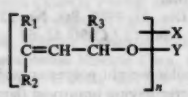
Continuation-in-part of Ser. No. 959,981, Nov. 13, 1978, abandoned. This application Dec. 8, 1980, Ser. No. 214,120

Int. Cl.³ C08G *12/30, 12/42*

U.S. Cl. 528—261 **8 Claims**

1. A process for the production of an air-drying, modified

amino-resin, which process consists of (a) co-polycondensing at least one dialkyl ether compound, which is a dialkyl ether of the dimethylol derivative of a compound containing two primary amino groups or two groups behaving as two disubstituted primary amino groups, with at least one compound containing an auto-oxidative group, or (b) polycondensing said dialkyl ether compound and reacting the compound containing an auto-oxidative group with the condensate; said compound containing said auto-oxidative group being a compound containing at least one allyl ether group, said compound having the general formula:



wherein n is 1 or an integer greater than 1; R_1, R_2 and R_3 are hydrogens or alkyls, the terminal group Y is an alkyl or heterocyclic radical and the group X is capable of becoming attached to the backbone of the polymer being formed, said group X being incapable of causing cross-linking, or said group X being —ZH in which Z is O, S or N and H is an active hydrogen atom, or said compound containing said auto-oxidative group contains two groups capable of reacting with active hydrogen atoms, and removing the released alcohol from the mixture.

4,349,661

PREPARATION OF POLYETHER ESTER AMIDES

Salih Mumcu, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 180,618

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2936976

Int. Cl.³ C08G *69/41, 63/42*

U.S. Cl. 528—288 **10 Claims**

1. In a method for preparing thermoplastic polyether amides or polyether ester amides from lactams, dicarboxylic acids and polyethers having hydroxyl end groups and amino end groups or polyethers having amino end groups, the improvement comprising:

(a) melting a mixture of said lactams having at least 8 C atoms and said dicarboxylic acids in a molar ratio of 100/7 to 100/120 at temperatures of about 230° to 300° C. while being mechanically mixed, in an inert gas atmosphere at atmospheric pressure in the absence of water for sufficient time to react said lactams to at least 99%;

(b) adding said polyethers to (a) in a molar ratio of 1/0.95 to 1/1.05 to said dicarboxylic acids of (a);

(c) homogenizing (b) with further mixing at about 230° to 290° C.; and

(d) carrying out a polycondensation of (c) at about 240° to 290° C.

4,349,662

POLYESTER RESINS FOR POLYURETHANE FOAMS PREPARED BY REACTING TWO DIACIDS, DIETHYLENE GLYCOL, A POLY(OXYETHYLENE) GLYCOL AND A CROSS-LINKING POLYOL

Carl Bernstein, Deerfield; James Stogis, Joliet; Travis Riddle, Justice, and Robert Kufrin, Chicago, all of Ill., assignors to Witco Chemical Corporation, New York, N.Y.

Filed May 13, 1981, Ser. No. 263,224

Int. Cl.³ C08G *63/02*

U.S. Cl. 528—301 **8 Claims**

1. A polyester, liquid at 70° F., for the production of flexible polyurethane foams, comprising the reaction product of a diacid, diethylene glycol, a viscosity increasing diacid replacing some of said diacid, and a poly(oxyethylene) glycol, wherein the resin formulation of 100 parts by weight contains about 1–12 parts by weight of the viscosity increasing diacid, about 1–15 parts by weight of the poly(oxyethylene) glycol and about 0.2–5.5 parts of a cross-linking polyol.

4,349,663

BIS(CYCLIC UREAS) MONOMER COMPOSITIONS USEFUL IN MAKING POLYURETHANE POLYMERS

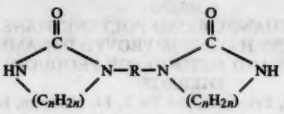
Edward A. Barsa, East Haven; Chung-Yuan Lin, Northford, and Fred A. Stuber, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 10, 1980, Ser. No. 205,632

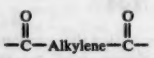
Int. Cl.³ C08G *73/00;* **B01J** *31/04, 27/14, 27/24, 31/12;* **C07D** *401/06, 401/10, 403/06*

U.S. Cl. 528—367 **15 Claims**

1. A bis(cyclic urea) having the formula:

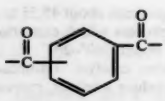


wherein: R is a divalent radical selected from the class consisting of



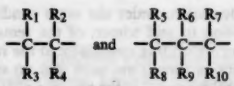
(a)

wherein alkylene contains from 1 to 11 carbon atoms, inclusive; and



(b)

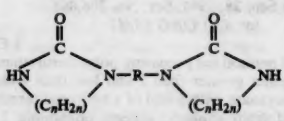
and C_nH_{2n} is alkylene selected from the class consisting of



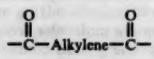
wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 R_9 and R_{10} are each independently selected from the class consisting of hydrogen and an inert substituent.

8. A storage stable composition adapted to form a polyurethane resin upon heating to a temperature in the range of about 100° C. to about 250° C. which composition comprises a mixture of:

(a) a bis(cyclic urea) having the formula:

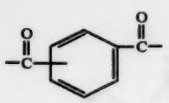


wherein R is a divalent radical selected from the class consisting of



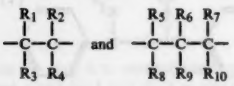
(a)

wherein alkylene contains from 1 to 11 carbon atoms, inclusive; and



(b)

and C_nH_{2n} is alkylene selected from the class consisting of



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} are each independently selected from the class consisting of hydrogen and an inert substituent; and

(b) a polymeric polyol.

9. A composition according to claim 8 which also comprises a catalyst for the reaction of isocyanate groups with hydroxyl groups.

4,349,664

DOPED ACETYLENE POLYMER AND PROCESS FOR PRODUCTION THEREOF

Yoshio Matsumura, Yamato; Ikuo Nozue, and Takashi Ukachi, both of Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1980, Ser. No. 166,995
Int. Cl.³ C08F *6/00*
U.S. Cl. 528—491 **21 Claims**

1. An acetylene polymer doped with a dopant selected from the group consisting of a platinum group metal complex, a carbonium salt, an oxonium salt and a parabenzoquinone derivative.

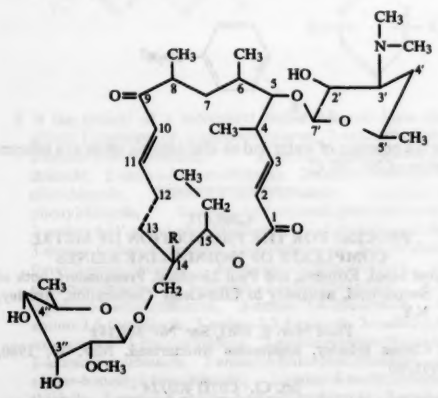
4,349,665

MACROLIDE ANTIBIOTIC COMPLEX

Bong K. Lee, East Brunswick; Joseph A. Marquez, Montclair, and J. Allan Waitz, Warren, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 27, 1980, Ser. No. 163,461
Int. Cl.³ C07H *17/08*
U.S. Cl. 536—7.1 **9 Claims**

1. AR-5-3 Complex consisting of compounds having the Planar structural formula:



wherein R is hydrogen or hydroxy and the dotted line represents a double bond between the carbon atoms of positions 12 and 13 or together with the carbon atoms at positions 12 and 13 an oxirane ring and the non-toxic pharmaceutically acceptable acid addition salts, and the non-toxic pharmaceutically acceptable 2'-monoesters, the 3'',4''-diesters, and the 2',3'',4'' triesters thereof, wherein the acyl moiety of said esters are derived from hydrocarbon carboxylic acids having 2 to 18 carbon atoms, and R is a member of the group consisting of hydrogen and hydroxy.

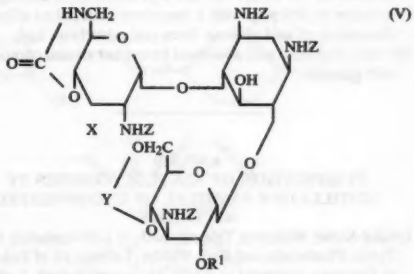
4,349,666

PROCESS FOR THE PRODUCTION OF KANOMYCIN B DERIVATIVES AND PRODUCTS OBTAINED THEREFROM

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Yokohama, and Toshiaki Miyake, Kawasaki, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,586
Claims priority, application Japan, Oct. 30, 1979, 54-139262
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—13.8 **9 Claims**

8. The 1,3,2',3''-N-sulfonylated, 4'',6''-O-protected, 6'-N:4'-O-carbonylated and 3'-halogenated kanamycin B derivative of the formula (V)



(V)

wherein X is a halo group, R^1 is hydrogen or benzylsulfonyl Y is an alkylidene group of 1~6 carbon atoms, a cycloalkylidene group of 3~6 carbon atoms, or tetrahydropyranylidene group as the divalent hydroxyl-protecting group, and each Z is tosyl as the amino-protecting group.

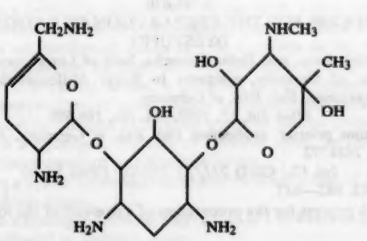
4,349,667

AMINOGLYCOSIDE ANTIBIOTIC G-367-2

Tadashiro Fujii, Mishima; Shuzo Satoi, Shizuoka; Naoki Muto, Shizuoka, and Mitsuo Hayashi, Shizuoka, Akira Kodama, Shizuoka; Masaru Otani; all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 9, 1980, Ser. No. 166,974
Claims priority, application Japan, Aug. 18, 1979, 54-105140
Int. Cl.³ A61K *31/71*; C07H *15/22*
U.S. Cl. 536—13.9 **2 Claims**

1. Aminoglycoside antibiotic of the formula



and the non-toxic acid addition salts thereof.

4,349,668

PROCESS FOR SEPARATING GLUCOSE FROM FRUCTOSE BY SELECTIVE ADSORPTION

Richard W. Neuzil, Downers Grove, and James W. Priegnitz, Elgin, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 690,769, May 27, 1976, abandoned. This application Oct. 17, 1980, Ser. No. 197,874

Int. Cl.³ C07H *1/06*

U.S. Cl. 536—127 **8 Claims**

1. A process for separating glucose from a mixture comprising glucose and fructose which process comprises the steps of:

(a) contacting said mixture at a temperature within the range of from 20° C. to 200° C. and a pressure from atmospheric pressure to 500 psig with an adsorbent comprising an X zeolite containing potassium cations at exchangeable cationic sites and selectively adsorbing said glucose in said adsorbent;

(b) removing from the adsorbent a raffinate stream comprising said fructose;

(c) contacting said adsorbent at a temperature within the range of from 20° C. to 200° C. and a pressure from atmospheric pressure to 500 psig with a desorbent material to effect the desorption of said glucose from said adsorbent; and,

(d) removing from said adsorbent an extract stream comprising said glucose.

4,349,669

PURIFICATION OF ALKYLGLYCOSIDES BY DISTILLATIVE REMOVAL OF UNCONVERTED ALCOHOLS

Erhard Klahr; Wolfgang Trieselt, both of Ludwigshafen; Horst Trapp, Plankstadt, and Rudi Widder, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1981, Ser. No. 222,619

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3001064

Int. Cl.³ C07H *1/06*

U.S. Cl. 536—127 **4 Claims**

1. In a process for purifying C_8–C_{16}-alkylglycosides which have been obtained by reacting lower alkylglycosides or hydroxyalkylglycosides with C_8–C_{16}-alcohols in the presence of an acid catalyst, by distillative removal of unconverted C_8–C_{16}-alcohols, the improvement that the distillative removal, at least of the last amounts of unconverted alcohols, is carried out in the presence of glycols which are added after substantial termination of the reaction whose boiling points are not more than 10° above, and not more than 30° below, those of the alcohols to be removed.

4,349,670

PROCESS FOR THE PREPARATION OF CATIONIC DYESTUFFS

Roderich Raue, and Heinz Giesecke, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

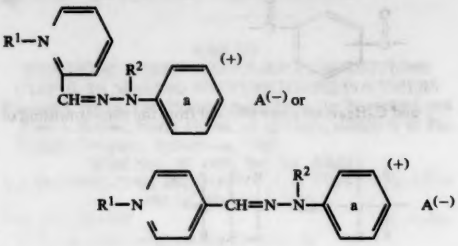
Filed Jul. 17, 1980, Ser. No. 169,580

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931772

Int. Cl.³ C07D *211/72, 215/06;* C09B *55/00*

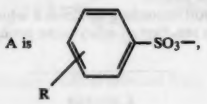
U.S. Cl. 542—417 **1 Claim**

1. A process for the preparation of a dyestuff of the formula



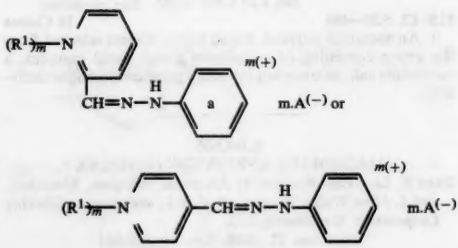
wherein

R^1 and R^2 are methyl or ethyl,



R is hydrogen, C_{1-4}-alkyl or halogen, and the benzene ring a can be substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy or halogen,

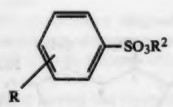
comprising reacting a compound of the formula



wherein

m is 0 or 1,

with an arylsulphonic acid ester of the formula



in the presence of water and an acid-binding agent at a temperature of 20°–70° C.

4,349,671

PROCESS FOR THE PRODUCTION OF METAL COMPLEXES OF ISOINDOLINE AZINES

Abul Iqbal, Ettingen, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

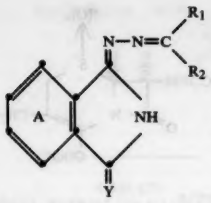
Filed Mar. 5, 1981, Ser. No. 241,141

Claims priority, application Switzerland, Mar. 13, 1980, 1975/80

Int. Cl.³ C07D *403/14*

U.S. Cl. 542—417 **9 Claims**

1. A process for the manufacture of a 1:1 metal complex of an azine of formula I

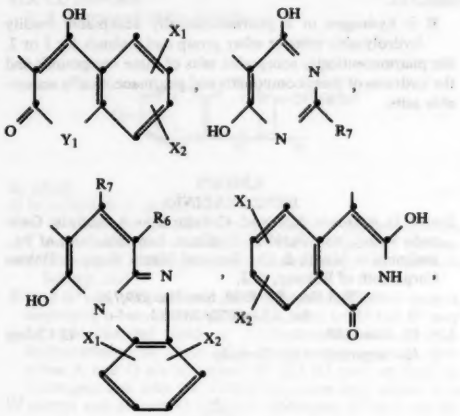


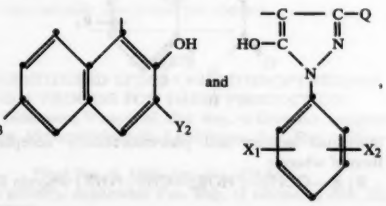
(I)

wherein the ring A is unsubstituted or is substituted by 2 to 4 chlorine atoms, by 1 to 2 alkyl or alkoxy groups having each 1 to 4 carbon atoms, by a phenoxy, by phenyl, by nitro, by benzoylamino or by a C_{2-6}-alkanoylamino group,

R_1 is a hydrogen atom or a methyl group,

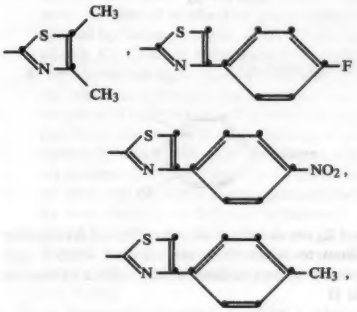
R_2 is a radical selected from the group consisting of

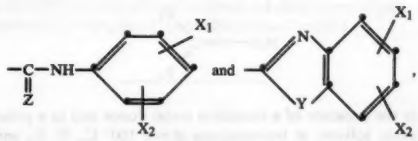




Y is the radical of a heteroaryl amine selected form the group consisting of 2-aminothiophene, 2-aminothiazole, 2-amino-5-nitrothiazole, 2-amino-5-methylsulfonyl-thiazole, 2-amino-5-cyanothiazole, 2-amino-4-methyl-5-nitrothiazole, 2-amino-4-methylthiazole, 2-amino-4-phenylthiazole, 2-amino-4-(4'-chloro)-phenylthiazole, 2-amino-4-(4'-nitro)-phenylthiazole, 2-aminopyrazole, 3-amino-1-phenylpyrazole, 3-aminoindazole, 5-methylsulfonyl-2-aminothiazole, 5-benzoyl-2-aminothiazole, 4-aminoimidazole, 4,5-dicyano-2-aminoimidazole, 4,5-diphenyl-2-aminothiazole, 2-amino-3,4-thiadiazole, 2-amino-3,5-thiadiazole, 3-amino-1,2,4-triazole, 2-amino-3,4-oxadiazole, 3-aminopyridine, 2-aminopyridine-N-oxide, 2-amino-benzthiazole, 2-amino-6-chlorobenzthiazole, 2-amino-6-methyl-benzthiazole, 2-amino-6-methoxybenzthiazole, 2-amino-6-chloro-4-nitrobenzthiazole, 2-amino-6-bromo-4-cyanobenzthiazole, 2-amino-6-cyano-4-methylbenzthiazole, 2-amino-6-methyl-4-nitrobenzthiazole, 2-amino-6-methoxy-4-nitrobenzthiazole, 2-amino-6-butoxy-4-chlorobenzthiazole, 2-amino-4-chloro-5-methoxybenzthiazole, 2-amino-4-bromo-6-methoxybenzthiazole, 2-amino-4,6-dichlorobenzthiazole, 2-amino-4,6-dibromobenzthiazole, 2-amino-4-methyl-6-(trifluoromethyl)-benzthiazole, 2-amino-4-methyl-6-propionylbenzthiazole, 2-amino-4-chloro-6-methylsulfonylbenzthiazole, 3-aminobenzisothiazole, 3-amino-5-chlorobenzisothiazole, 2-amino-3-cyanotetrahydrobenzthiaphene, 2-amino-benzimidazole, 2-amino-6-chlorobenzimidazole, 2-amino-6-bromo-benzimidazole, 2-amino-6-methylbenzimidazole, 2-amino-6-methoxy-benzimidazole, 2-amino-6-ethoxybenzimidazole, 2-amino-6-methylsulfonyl-benzimidazole, 2-amino-6-acetylaminobenzimidazole, 2-aminopyridine, diaminophthalazine, 2-amino-4-hydroxyquinoline, 2,6-diaminopyridine and 2-amino-4,5-dimethylthiazole, or Y is a group of the formula

R' is $-CONH_2$, $-CSNH_2$ or a radical selected from the group consisting of





Y_1 is —O—, —S— or —NH—,

Y_2 is a hydrogen atom, a carboxyl or carbamoyl group, an alkoxycarbonyl or alkylcarbamoyl group containing 2 to 6 carbon atoms, a phenylcarbamoyl group which is unsubstituted or substituted in the phenyl moiety by halogen atoms, alkyl or alkoxy groups containing 1 to 4 carbon atoms,

Y_3 is a hydrogen or a halogen atom, a methoxy, nitro or cyano group,

X_1 is a hydrogen, chlorine or bromine atom, a nitro, trifluoromethyl, carbamoyl or sulfamoyl group, an alkyl, alkoxy or alkylsulfamoyl group of 1 to 4 carbon atoms, an alkanoylamino, alkylcarbamoyl or alkoxycarbonyl group of 2 to 6 carbon atoms, a phenoxy, phenylcarbamoyl or phenylsulfamoyl group which is unsubstituted or substituted by chlorine or bromine atoms or methyl groups,

X_2 is a hydrogen, chlorine or bromine atom, an alkyl or alkoxy group of 1 to 4 carbon atoms,

R_6 is a cyano, carbamoyl or alkoxycarbonyl group of 2 to 6 carbon atoms,

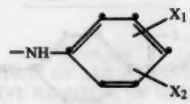
R_7 is a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, a phenyl or hydroxy group,

Q is a methyl group or an alkoxycarbonyl group containing 2 to 5 carbon atoms or a carbamoyl group,
Z is —O— or —S— and
V is —O—, —S— or —NH—,
which process comprises reacting a compound of the formula II

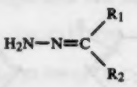
(II)

wherein
R_3 is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and
R_4 is an alkyl group having 1 to 6 carbon atoms, or

is the radical of the formula



wherein X_1 and X_2 are as defined above, or R_3 and R_4 together with the N-atom to which they are attached form a pyrrolidino, piperidino or morpholino radical, with a hydrazone of the formula II


(III)

in the presence of a transition metal donor and in a polar organic solvent, at temperatures above 100° C., Y, R_1 and R_2 having the meanings given under formula I, and the ring A being as defined under formula I.

4,349,672

CEPHALOSPORIN DERIVATIVES

Marc Montavon, and Roland Reiner, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 17, 1980, Ser. No. 207,163

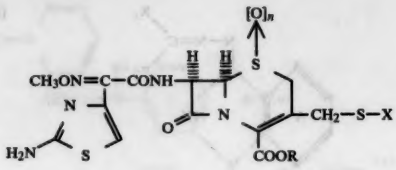
Claims priority, application Switzerland, Nov. 29, 1979, 10601/79

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

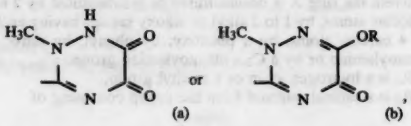
Int. Cl.³ C07D *501/36*; A61K *31/545*

U.S. Cl. 544—027 **10 Claims**

1. A compound of the formula


I

wherein X is the group


(a) (b)

R is hydrogen or a pharmaceutically acceptable readily hydrolysable ester or ether group and n stands for 1 or 2, the pharmaceutically acceptable salts of these compounds and the hydrates of these compounds and pharmaceutically acceptable salts.

4,349,673

BENZOXAZINES

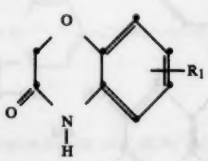
Joseph G. Atkinson, Montreal, Canada; John J. Baldwin, Gwynedd Valley, and David E. McClure, Lansdale, both of Pa., assignors to Merck & Co., Inc. and Merck Sharp & Dohme Corp., both of Rahway, N.J.

Filed Dec. 23, 1980, Ser. No. 219,726

Int. Cl.³ C07D *265/36*

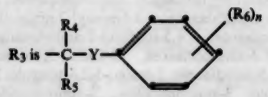
U.S. Cl. 544—105 **12 Claims**

1. A compound of the formula:

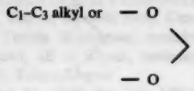

(a)

individual isomers and pharmaceutically acceptable salts thereof wherein
R_1 is $—OCH_2—CHOR_2—CH_2—NHR_3$ wherein R_2 is H or

wherein
L is phenyl or C_1–C_5 alkyl and



wherein
R_4 and R_5 are independently selected from H and C_1–C_3alkyl,
Y is CH_2, $(CH_2)_2$ or $—CH_2O—$
R_6 is H, OH, OCH_3, halogen,



and

n is 1 or 2.

4,349,674

QUINOALINYL ESTERS OF CARBAMIMIDOTHIOIC ACIDS

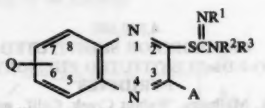
Elisabeth H. Freed, deceased, late of Paoli, Pa. (by Meier E. Freed, executor); Peter H. L. Wei, Springfield, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,295

Int. Cl.[3] **C07D** *241/42, 401/12;* **A61K** *31/495*

U.S. Cl. 544—353 **23 Claims**

1. A compound of the formula:



in which

Q is hydrogen or nitro;

A is hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, carbomethoxy, carbethoxy, carbopropoxy, carbisopropoxy, carbobutoxy, carbisobutyoxy, or carbo-t-butoxy; and

R^1 and R^2 are, independently, hydrogen, methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, t-butyl, allyl, or R^1 and R^2 may be concatenated with a 1,4-hydrocarbylene or 1,4-hydrocarbenylene chain of 4 carbon atoms; except that, when A and Q are hydrogen, R^1 and R^2 may not both be hydrogen; and with the further exception that, where A is methyl and R^1 and Q are both hydrogen, R^2 may not be ethyl;

or a pharmaceutically acceptable salt thereof.

4,349,675

4,4-DISUBSTITUTED SPIRO-1,4-DIHYDROPYRIDINES AND A PROCESS FOR THEIR PRODUCTION

Siegfried Goldmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

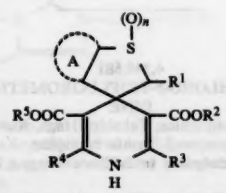
Filed Jun. 4, 1981, Ser. No. 270,455

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023820

Int. Cl.[3] **C07D** *471/10, 471/20*

U.S. Cl. 546—17 **12 Claims**

1. A compound of the formula



(I)

in which

Ⓐ represents a monocyclic or bicyclic carbocyclic aryl radical or a heterocyclic radical selected from furyl, pyrryl, pyrazolyl, imidazolyl, oxazolyl, isoxazolyl, pyridyl, pyridazinyl, pyrimidyl, pyrazinyl, quinolyl, isoquinolyl, indolyl, benzimidazolyl, quinazolyl or quinoxalyl, the said aryl radical or heterocyclic radical being unsubstituted or containing 1, 2 or 3 identical or different substituents selected from phenyl, C_1–C_8-alkyl, C_1–C_8-alkenyl, C_1–C_8-alkinyl, C_1–C_8-alkoxy, C_1–C_6-alkylene, C_1–C_4-dioxyalkylene, halogen, trifluoromethyl, trifluoromethoxy, C_1–C_4-alkylamino, nitro, cyano, azido and carboxamido,

R^3 and R^4 are identical or different and each represent a hydrogen atom or an achiral straight-chain or branched C_1–C_8-alkyl radical, a monocyclic or bicyclic carbocyclic aryl radical or a monocyclic or bicyclic carbocyclic aryl-C_1–C_4-alkyl radical, said aryl and aralkyl radicals being unsubstituted or substituted by 1, 2 or 3 identical or different substituents selected from phenyl, C_1–C_8-alkyl, C_1–C_8-alkenyl, C_1–C_8-alkinyl, C_1–C_8-alkoxy, C_1–C_6-alkylene, C_1–C_4-dioxyalkylene, halogen, trifluoromethyl, trifluoromethoxy, C_1–C_4-alkylamino, nitro, cyano, azido and carboxamido on the aryl nucleus and containing 1 to 2 carbon atoms in the alkyl portion,

R^2 and R^5 are identical or different and each represent a straight-chain or branched C_1–C_8-alkyl radical, which is optionally interrupted in the chain by oxygen and is optionally substituted by halogen, pyridyl, phenyl or phenoxy, the phenyl or phenoxy group optionally being substituted by halogen, cyano, di-C_1–C_4-alkylamino, C_1–C_4-alkoxy, C_1–C_4-alkyl, trifluoromethyl or nitro,

R^1 represents a straight-chain or branched C_1–C_8-alkyl radical which is optionally interrupted in the chain by one oxygen and is optionally substituted by phenyl, phenoxy, pyridyl or amino, the phenyl, phenoxy or pyridyl radicals optionally being substituted by halogen, cyano, di-C_1–C_4-alkylamino, C_1–C_4-alkoxy, C_1–C_4-alkyl, trifluoromethyl or nitro, and the amino group optionally being substituted by two identical or different substituents selected from C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, a monocyclic or bicyclic carbocyclic aryl and a monocyclic or bicyclic carbocyclic aryl-C_1–C_4-alkyl radical and

n is 0, 1 or 2.

7. A compound according to claim 1 which is 4,4'-Spiro-[2,6-dimethyl-3,5-bismethoxycarbonyl-1,4-dihydropyridine]-2'-methyl-[2',3'-dihydro-1'-benzothiophene-1'-oxide].

4,349,676

INSECTICIDAL SYNERGIST

James E. Powell, Ripon, and James R. Sanborn, Modesto, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1981, Ser. No. 314,805

Int. Cl.[3] **C07D** *217/24;* **A01N** *9/22*

U.S. Cl. 546—141 **1 Claim**

1. 3,4-dihydro-2-(2-propynyl)isocarbostyril.

4,349,677

3,4-DIHYDRO-3,4-ISOQUINOLINEDIONE 4-OXIME

Thomas J. Schwan; Homer A. Burch, and Joseph E. Gray, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,443

Int. Cl.[3] **C07D** *217/24;* **A61K** *31/47*

U.S. Cl. 546—142 **1 Claim**

1. The compound 3,4-dihydro-3,4-isoquinolinedione 4-oxime.

4,349,678

OCTAHYDRO-2-METHYL-ISOQUINOLINE-6,8-DIONE

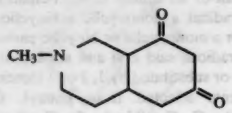
Leo Berger, Montclair, and Gary L. Olson, Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 73,813, Sep. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 950,947, Oct. 13, 1978, abandoned. This application Dec. 12, 1980, Ser. No. 215,941

Int. Cl.³ C07D *217/24*

U.S. Cl. 546—150 **1 Claim**

1. A compound of the formula:



XII

4,349,679

PYRROLIDINO AND PIPERIDINO BENZ RING SUBSTITUTED PHTHALIDES

Robert Garner, Bury, and Michael J. Whitehead, Failsworth, both of England, assignors to Giba-Geigy Corporation, Ardsley, N.Y.

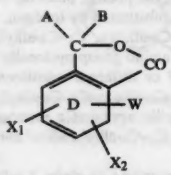
Filed May 10, 1979, Ser. No. 38,023

Claims priority, application United Kingdom, May 18, 1978, 20455/78

Int. Cl.³ C09B *57/00*; C07D *405/04*

U.S. Cl. 546—196 **8 Claims**

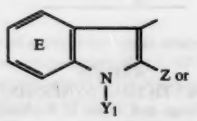
1. A phthalide compound of the formula



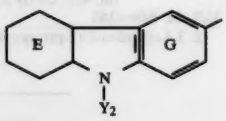
(I)

wherein A and B, independently of the other, represent a monovalent radical of the formula

(1b)



(1c)



(1d)

wherein X_1 represents an amino group of the formula

X_2 represents halogen or an amino group of the formula

W is hydrogen or halogen, T_1 and T_2 together with the nitrogen atom to which they are attached represent a pyrrolidino or piperidino radical, Y, Y_1 and Y_2 each represent hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, lower alkoxy or cyano, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, Z represents hydrogen, lower alkyl or phenyl, and wherein the benzene ring D is not further substituted or additionally contains halogen and the rings E and G independently of the other, are unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, with the proviso that at least one of W and X_2 is halogen.

4,349,680

6-(CHLORO OR SUBSTITUTED PHENOXY)-2-DI-(SUBSTITUTED PHENOXY) METHYL PYRIDINES

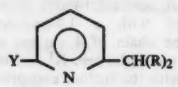
Sudarshan K. Malhotra, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 266,016, Sep. 18, 1980. This application Oct. 30, 1981, Ser. No. 316,609

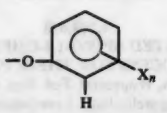
Int. Cl.³ C07D *213/30, 405/12*

U.S. Cl. 546—302 **5 Claims**

1. A compound corresponding to the formula



wherein Y represents chloro [or R']; R represents



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkyl sulfonyl of 1 to 4 carbon atoms, trifluoromethyl, chloro, fluoro or bromo; n represents an integer of 0 to 2 or X_n represents 3,4-methylenedioxy.

4,349,681

2-AMINO-3-CHLORO-5-TRIFLUOROMETHYLPYRIDINE

Isao Yokomichi, Moriyama; Takahiro Haga, Kusatsu; Kuniaki Nagatani, Kusatsu, and Toshio Nakajima, Kusatsu, all of Shiga, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,971

Claims priority, application Japan, Dec. 24, 1979, 54-167986

Int. Cl.³ C07D *213/72, 211/72*

U.S. Cl. 546—304 **1 Claim**

1. 2-Amino-3-chloro-5-trifluoromethylpyridine.

4,349,682

2-(3-TRIMETHYLSILYLPROPYL)BENZOTHIAZOLE

Shigeshi Toyoshima, Tokyo; Ryuichi Sato, Gunma; Koichi Ito, Higashi-Kurume; Toshio Shinohara, Annaka, and Yasushi Yamamoto, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1980, Ser. No. 186,211
Claims priority, application Japan, Sep. 17, 1979, 54-119030
Int. Cl.³ C07F 7/10; A61K 31/425
U.S. Cl. 548—110 1 Claim

1. 2-(3-trimethylsilylpropyl)benzothiazole.

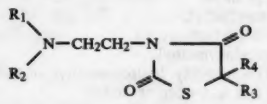
4,349,683

THIAZOLIDINE-2,4-DIONE DERIVATIVES

Dennis C. Bigg, Marsillargues, France, assignor to Synthelabo, Paris, France

Continuation of Ser. No. 914, Dec. 29, 1978, abandoned. This application Aug. 26, 1980, Ser. No. 181,475
Claims priority, application France, Dec. 29, 1977, 77 39559; Nov. 24, 1978, 78 33244
Int. Cl.³ C07D 277/04
U.S. Cl. 548—183 6 Claims

1. A compound of the formula



wherein

R_1 is H, CH_3, C_2H_5, benzyl, 4-chlorobenzyl, or CH_3CO;

R_2 is H; R_3 is phenyl, 4-chlorophenyl, 4-fluorophenyl, 4-bromophenyl, 1-naphthyl, 3—CF_3—C_6H_4, 3-methoxyphenyl, 3-chlorophenyl, 2,4-dichlorophenyl, 3,4-dichlorophenyl, 2-bromo-4,5-dimethoxyphenyl; and

R_4 is H or CH_3 with the proviso that if R_3 is phenyl, R_4 is CH_3

or a pharmaceutically addition acceptable salt thereof.

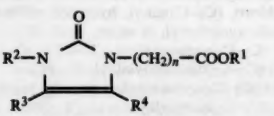
4,349,684

N-SUBSTITUTED ω-(2-OXO-4-IMIDAZOLIN-1-YL) ALCANOIC ACIDS AND SALTS AND ESTERS THEREOF

Hans-Heiner Lautenschläger, Pulheim-Stommeln; Hans Betzing, Kerpen-Horrem; Brigitte Stoll, Pulheim, and Manfred Probst, Frechen, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,962
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042466
Int. Cl.³ C07D 233/70
U.S. Cl. 548—320 18 Claims

1. N-substituted ω-(2-oxo-4-imidazolin-1-yl) alcanoic acids and their derivatives having the general formula I



I

wherein

n is an integer from 1 to 10,

R^1 is hydrogen, an alkali metal ion or a straight or branched hydrocarbon group having from 1 to 6 carbon atoms or the benzyl group,

R^2 is $—(CH_2)_m—R$ wherein m is 0, 1 or 2,

R, R^3 and R^4 which may be identical or different from each other, represent hydrogen (with the exception of R if m is zero), the unsubstituted phenyl group or the phenyl group substituted by one or several equal or differing substituents selected from the group of halogen, CH_3—, CH_3O—, —CF_3, at least one of R, R^3 and R^4 representing the unsubstituted phenyl or the phenyl group substituted by one or several identical or differing substituents selected from the group of halogen, —CH_3, CH_3O—, —CF_3.

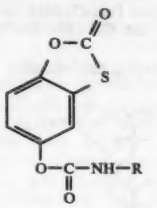
4,349,685

5-SUBSTITUTED-BENZOXATHIOL-2-ONES

Joseph E. Dunbar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 27, 1981, Ser. No. 296,761
Int. Cl.³ C07D 327/04
U.S. Cl. 549—33 7 Claims

1. A compound corresponding to the formula:



wherein R represents a lower alkyl, substituted aryl, haloalkyl, carbalkoxyalkylene or an alkyl carbonyloxyalkylene group.

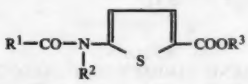
4,349,686

5-(N-ALKYL-N-ACYL-AMINO)-THIOPHEN-2-CARBOXYLIC ACID DERIVATIVES

Hans-Heiner Lautenschläger, Pulheim-Stommeln; Hans Betzing, Kerpen-Horrem; Johannes Winkelmann, Cologne; Manfred Probst, Frechen, and Brigitte Stoll, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,608
Int. Cl.³ C07D 333/24; A61K 31/38
U.S. Cl. 549—69 6 Claims

1. 5-(N-Alkyl-N-acyl-amino)-thiophen-2-carboxylic acid derivatives having the general formula I



I

wherein

R^1 is an alkyl group having from 1 to 5 carbon atoms,

R^2 is an alkyl group having from 12 to 18 carbon atoms,

R^3 is hydrogen, alkali or an alkyl group having from 1 to 3 carbon atoms.

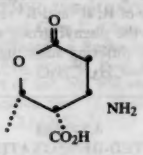
4,349,687

INTERMEDIATE FOR SYNTHESIS OF THIENAMYCIN VIA (3SR, 4RS)-3-[1 (SR)-HYDROXYETHYL]-2-OXO-4-AZETIDINEACETIC ACID

Thomas M. H. Liu, Westfield; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 112,021, Jan. 14, 1980, abandoned. This application Apr. 8, 1981, Ser. No. 252,103
Int. Cl.³ C07C 309/30
U.S. Cl. 549—291 1 Claim

1. The compound having the structural formula:



7

4,349,688

POLYOXYALKYLENE POLYCARBOXYLATE ESTERS

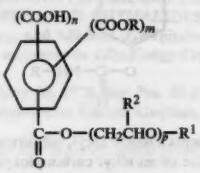
Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 969,594, Dec. 14, 1978, Pat. No. 4,290,765. This application Feb. 17, 1981, Ser. No. 234,293

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—91 **6 Claims**

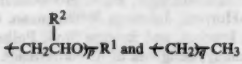
1. A compound having the formula



wherein

(a) the ring can have all positional isomer arrangements;

(b) R is selected from the group consisting of



(c) R^1 and R^2 are independently selected from the group consisting of hydrogen and $—CH_3$;

(d) n and m are independently selected from an integer of 0 to 3 wherein the sum of n and m is 1 to 3 with the proviso that when n is 0, m is 2 or 3;

(e) p is an integer of 6 to 23; and

(f) q is an integer of 3 to 11.

4,349,689

METHANO CARBACYCLIN ANALOGS

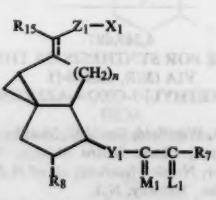
Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 22, 1980, Ser. No. 219,106

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—117 **5 Claims**

1. A carbacyclin analog of formula X:



X

wherein n is one or 2;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein M_1 is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_7 is

(1) $—C_mH_{2m}—CH_3$, wherein m is an integer from one to 5, inclusive,

(2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl, with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different,

(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl,

(4) cis—CH=CH—CH_2—CH_3,

(5) $—(CH_2)_2—CH(OH)—CH_3$, or

(6) $—(CH_2)_3—CH=C(CH_3)_2$;

wherein $—C(L_1)—R_7$ taken together is

(1) (C_4–C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5) alkyl;

(2) 2-(2-furyl)ethyl,

(3) 2-(3-thienyl)ethoxy, or

(4) 3-thienyloxymethyl;

wherein R_8 is hydroxy, hydroxymethyl, or hydrogen;

wherein R_{15} is hydrogen or fluoro;

wherein X_1 is

(1) $—COOR_1$, wherein R_1 is

(a) hydrogen,

(b) (C_1–C_{12})alkyl,

(c) (C_3–C_{10})cycloalkyl,

(d) (C_7–C_{12})aralkyl,

(e) phenyl, optionally substituted with one, 2 or 3 chloro or (C_1–C_3)alkyl,

(f) phenyl substituted in the para position by

(i) $—NH—CO—R_{25}$,

(ii) $—CO—R_{26}$,

(iii) $—O—CO—R_{54}$, or

(iv) $—CH=N—NH—CO—NH_2$ wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{54} is phenyl or acetamidophenyl; inclusive, or

(g) a pharmacologically acceptable cation;

(2) $—CH_2OH$,

(3) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{51}R_{52}$, wherein R_{51} and R_{52} are

(i) hydrogen,

(ii) (C_1–C_{12})alkyl,

(iii) (C_3–C_{10})cycloalkyl,

(iv) (C_7–C_{12})aralkyl,

(v) phenyl, optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,

(vi) (C_2–C_5)carboxyalkyl,

(vii) (C_2–C_5)carbamoylalkyl,

(viii) (C_2–C_5)cyanoalkyl,

(ix) (C_3–C_6)acetylalkyl,

(x) (C_7–C_{11})benzoylalkyl, optionally substituted by one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)alkoxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,

(xi) pyridyl, optionally substituted by one, 2 or 3 chloro, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,

(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)alkyl,

(xiii) (C_1–C_4)hydroxyalkyl,

(xiv) (C_1–C_4)dihydroxyalkyl,

(xv) (C_1–C_4)trihydroxyalkyl, with the further pro-

viso that not more than one of R_{51} and R_{52} is other than hydrogen or alkyl,

(b) cycloamino selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12})alkyl of one to 12 carbon atoms, inclusive,

(c) carbonylamino of the formula $—NR_{53}COR_{51}$, wherein R_{53} is hydrogen or (C_1–C_4)alkyl and R_{51} is other than hydrogen, but otherwise as defined above,

(d) sulfonylamino of the formula $—NR_{53}SO_2R_{51}$, wherein R_{51} and R_{53} are as defined in (c),

(4) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or (C_1–C_4)-alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$,

wherein Y_1 is trans—CH=CH—, cis—CH=CH—, $—CH_2CH_2—$, or —C≡C—; and

wherein Z_1 is

(1) $—CH_2—(CH_2)_f—C(R_2)_2$, wherein R_2 is hydrogen or fluoro and f is zero, one, 2, or 3,

(2) trans—CH_2—CH=CH—,

(3) —(Ph)—$(CH_2)_g$—, wherein (Ph) is 1,2-, 1,3-, or 1,4-phenylene and g is zero, one, 2, or 3,

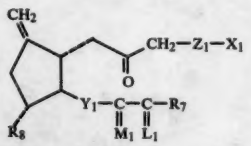
with the proviso that Z_1 is —(Ph)—$(CH_2)_g$— only when R_{15} is hydrogen.

4,349,690
9-DEOXY-9-METHYLENE-6-KETO-PGE-TYPE COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 23, 1981, Ser. No. 256,624
Int. Cl.³ C07C 177/00
U.S. Cl. 560—121 **5 Claims**

1. A compound of the formula I,



wherein X_1 is:

(1) $—COOR_1$, wherein R_1 is

(a) hydrogen,

(b) (C_1–C_{12})alkyl,

(c) (C_3–C_{10})cycloalkyl,

(d) (C_7–C_{12})aralkyl,

(e) phenyl, optionally substituted with one, 2 or 3 chloro or (C_1–C_3)alkyl,

(f) phenyl substituted in the para position by

(i) —NH—CO—R_{25},

(ii) —CO—R_{26},

(iii) —O—CO—R_{24}, or

(iv) $—CH=N—NH—CO—NH_2$ wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{24} is phenyl or acetamidophenyl; inclusive, or

(g) a pharmacologically acceptable cation;

(2) $—CH_2OH$,

(3) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are

(i) hydrogen,

(ii) (C_1–C_{12})alkyl,

(iii) (C_3–C_{10})cycloalkyl,

(iv) (C_7–C_{12})aralkyl,

(v) phenyl, optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5) alkoxycarbonyl, or nitro,

(vi) (C_2–C_5)carboxyalkyl,

(vii) (C_2–C_5)carbamoylalkyl,

(viii) (C_2–C_5)cyanoalkyl,

(ix) (C_3–C_6)acetylalkyl,

(x) (C_7–C_{11})benzoylalkyl, optionally substituted by one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)alkoxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,

(xi) pyridyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,

(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)-alkyl,

(xiii) (C_1–C_4)hydroxyalkyl,

(xiv) (C_1–C_4)dihydroxyalkyl,

(xv) (C_1–C_4)trihydroxyalkyl,

with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl,

(b) cycloamino selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrrolino, or 3,4-didehydro piperidinyl optionally substituted by one or 2 (C_2–C_{12})alkyl of one to 12 carbon atoms, inclusive;

(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or (C_1–C_4)alkyl and R_{21} is other than hydrogen, but otherwise as defined above,

(d) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined in (c),

(4) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen or (C_1–C_4)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$;

wherein Z_1 is:

(1) $—CH_2—(CH_2)_f—C(R_2)_2$, wherein R_2 is hydrogen or fluoro and f is zero, one, 2 or 3,

(2) trans—CH_2—CH=CH—,

(3) —(Ph)—$(CH_2)_g$—, wherein (Ph) is 1,2-, 1,3-, or 1,4-phenylene and g is zero, one, 2, or 3;

wherein R_8 is: hydrogen, hydroxy, hydroxymethyl, $—OR_{10}$ or $—CH_2OR_{10}$, wherein R_{10} is tetrahydropyranyl, tetrahydrofuranyl, or $—C(OR_{11})(R_{12})—CH(R_{13})(R_{14})$ wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $—(CH_2)_a—$ or when R_{12} and R_{13} are taken together $—(CH_2)_b—O—(CH_2)_c$, wherein a is 3, 4, or 5 and b is one, 2 or 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;

wherein Y_1 is: trans—CH=CH—, cis—CH=CH—, $—CH_2CH_2—$ or —C≡C—;

wherein M_1 is α-OR_{12}:β-R_5 or α-R_5:β-OR_{12}, wherein R_5 is hydrogen or methyl and R_{12} is hydrogen or methyl, with the proviso that R_{12} is methyl only when R_5 is hydrogen;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 is:

(1) $—(CH_2)_m—CH_3$, wherein m is an integer from one to 5, inclusive;

(2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3-)alkoxy, with the proviso that not more than two substitutents are other than alkyl;

(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two or three chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3-

)alkoxy, with the proviso that not more than two substituents are other than alkyl;
(4) cis—CH=CH—CH_2—CH_3;
(5) —$(CH_2)_2$—CH(OH)—CH_3, or
(6) —$(CH_2)_3$—CH=$C(CH_3)_2$;
(7) cyclopentyl, optionally substituted in the 3 position by (C_1–C_4)alkyl;
(8) cyclohexyl optionally substituted by (C_1–C_4)alkyl,
(9) —$C(R_3R_4)$—$(CH_2)_n$—CH_2R_{14} wherein R_3 and R_4 are as defined above (in L_1), n is an integer from 1 to 4 and R_{14} is hydrogen or 1–4C alkyl;

wherein —$C(L_1)$—R_7 taken together is
(1) cyclopentyl optionally substituted in the 3 position by (C_1–C_4)alkyl,
(2) cyclohexyl optionally substituted by (C_1–C_4)alkyl,
(3) 2-(2-furyl)ethyl,
(4) 2-(3-thienyl)ethoxy, or
(5) 3-thienyloxymethyl.

4,349,691

METHOD OF MAKING CONSTANT VOLTAGE SOLAR CELL AND PRODUCT FORMED THEREBY UTILIZING LOW-TEMPERATURE ALUMINUM DIFFUSION

Joseph Lindmayer, Rockville, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation of Ser. No. 784,909, Apr. 5, 1977, abandoned. This application Apr. 25, 1980, Ser. No. 143,780

Int. Cl.³ H01L *21/225, 21/24*

U.S. Cl. 136—261 8 Claims

1. A method of forming a back junction in an n-p solar energy cell having a front surface adapted to receive light impinging thereon and an opposed back surface, comprising applying a coating of aluminum to the back surface of the wafer, and heating the wafer at a temperature at about 520° to 600° C. for a period of time sufficient to cause the aluminum to penetrate the back surface and form a back junction in the wafer, so that when light impinges on the front surface of the wafer, the cell will generate electricity at a generally constant voltage over a substantial range of light intensities.

4,349,692

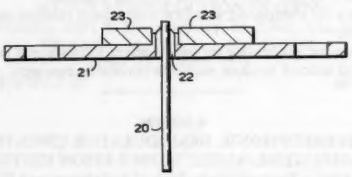
GLASS HERMETIC SEAL

Earl K. Davis, Tempe, and Robert W. Hey, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 237,001, Feb. 23, 1981, Pat. No. 4,309,507. This application Jun. 30, 1981, Ser. No. 279,131

Int. Cl.³ H01L *23/08*

U.S. Cl. 174—52 H 4 Claims



1. In a method for making an electrical device having one electrically conductive member hermetically sealed to another member by a glass, the improvement comprising:

utilizing a glass characterized by tensile stress in said glass as measured with a fusion couple comprising said glass and the material of which said conductive member is made, and wherein said glass consists essentially of the following ingredients by weight percent,

SiO_2:63–68
Al_2O_3:3–6
K_2O:8–9
Na_2O:5–6
Li_2O:0.5–1.5
BaO:2–4
SrO:5–7
CaO:2–4
MgO:0.5–1.5
TiO_2:0.5–1.5
B_2O_3:0.5–1.5.

3. An enclosure for an electrical device comprising:

a portion of said enclosure defining at least one aperture;

at least one electrically conductive lead positioned within said aperture;

a semiconductor chip mounted within said enclosure and electrically connected to said at least one electrically conductive lead;

means within said aperture and surrounding said at least one lead for sealing said aperture, said means comprising a glass characterized by tensile stress in said glass as measured in a fusion couple comprising said glass and the material of which said at least one lead is made; and

wherein said means for sealing said aperture comprises an insulating sealing glass of composition consisting essentially of the following ingredients by weight percent,

SiO_2:63–68
Al_2O_3:3–6
K_2O:8–9
Na_2O:5–6
Li_2O:0.5–1.5
BaO:2–4
SrO:5–7
CaO:2–4
MgO:0.5–1.5
TiO_2:0.5–1.5
B_2O_3:0.5–1.5.

4,349,693

APPARATUS FOR SEALING AN ELECTRICAL COMPONENT

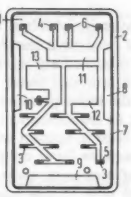
Fritz Hinrichs, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,697

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026371

Int. Cl.³ H05K *5/06*

U.S. Cl. 174—52 PE 7 Claims



1. An apparatus for sealing an electrical component comprising:

a housing having a housing wall for sealing a hollow inner chamber of said housing;

a plurality of capillary gaps in said housing wall disposed in regions of terminal pins which extend through said housing wall or at a boundary on said housing wall;

at least two dispensing points in said housing wall respectively connected to different ones of said plurality of capillary gaps for reception and distribution of sealing compound introduced to said dispensing points to said capillary gaps via a plurality of interconnecting capillary channels,

said dispensing points being respectively connected to capillary gaps and capillary channels of substantially equal capillary characteristics for uniform distribution of said sealing compound to all capillary gaps connected to a dispensing point.

4,349,694

SUB-MARINE TELEPHONE CABLE

Jean-Patrick Vives, Calais, France, assignor to Les Cables de Lyon, Lyons, France

Continuation-in-part of Ser. No. 796,813, May 13, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,392

Claims priority, application France, May 25, 1976, 76 15788

Int. Cl.³ H01B *5/10*

U.S. Cl. 174—128 R 4 Claims

1. A central conductor for a coaxial telephone cable comprising a compound twisted core of high-tensile steel wires and of aluminium-based wires encased in a longitudinally welded copper tube which is applied tightly around the twisted core, said twisted core comprising, from its axis to its periphery,

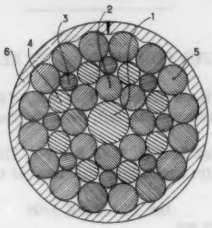
(a) an axial wire of aluminium-based metal of a relatively large diameter, said aluminium-based wire having a high tensile

strength, a high breaking elongation and a good electrical conductivity,

(b) an inner layer of high-tensile steel wires of the same diameter, lesser than that of said axial wire,

(c) an intermediate layer of alternated high-tensile steel and aluminium-based wires,

(d) an outer layer of high-tensile steel wires of the same diameter, said steel wires being so interrelated that any steel wire of said intermediate layer is in contact with a steel wire of said inner layer and with two steel wires of said outer layer and forms therewith a Y configuration, any group of two adjacent Y configurations leaving between them a void in



the intermediate layer in which is located an aluminium-based wire, and the respective diameters of said aluminium-based wires of said intermediate layer and of said steel wires of said intermediate and said outer layers being such that under the effect of the radial pressure exerted on the core by a sizing die during its manufacture any group of two steel wires of said outer layer in contact with an aluminium-based wire of said intermediate layer come into mutual contact, while any group of two steel wires of said outer layer in contact with a steel wire of said intermediate layer do not come into mutual contact, thereby lessening the crushing of the aluminium-based wires under the effect of said radial pressure.

4,349,695

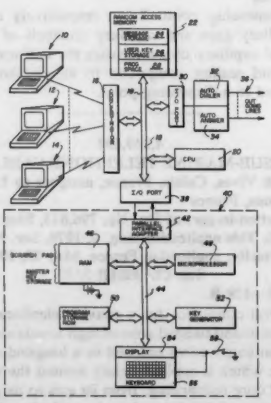
RECIPIENT AND MESSAGE AUTHENTICATION METHOD AND SYSTEM

Barrie O. Morgan, Dallas, and David W. Abmayr, Carrollton, both of Tex., assignors to Datotek, Inc., Dallas, Tex.

Filed Jun. 25, 1979, Ser. No. 51,903

Int. Cl.³ H04L *9/00*

U.S. Cl. 178—22.08 **7 Claims**



1. A system for authenticating a message recipient prior to transmission of a message between an authenticator station and the message recipient comprising:

means for transmitting a user identification signal from said message recipient to said authenticator station,

means for producing an enciphered user key and a message key in response to said user identification signal,

means for deciphering the enciphered user key using a predetermined master key,

means for generating a random character,

means for enciphering said random character in response to said deciphered user key,

means for storing said message key and said enciphered random character,

means for transmitting said message key and said enciphered random character to said message recipient,

means for receiving said enciphered random character and said message key at said message recipient location,

means for deciphering said enciphered random character in response to said user key,

means for varying said random character in a predetermined manner,

means for enciphering said varied random character,

means for transmitting said enciphered varied random character to said authenticator station,

means for deciphering said enciphered varied random character in response to said user key,

means for varying said deciphered varied random character in the inverse as said predetermined manner, to provide a first random number,

means for deciphering said stored enciphered random character to provide a second random number,

means for comparing said first and second random numbers, and

means for generating an authenticate indication if said first and second random numbers favorably compare.

4,349,696

AM STEREOPHONIC DEMODULATOR CIRCUIT FOR AMPLITUDE/ANGLE MODULATION SYSTEM

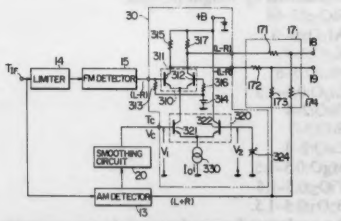
Isao Akitake; Tsutomu Noda, both of Yokohama, and Kazuhiko Yamazaki, Iwaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1980, Ser. No. 117,457

Claims priority, application Japan, Feb. 5, 1979, 54-11459; Aug. 22, 1979, 54-106082; Aug. 22, 1979, 54-106084

Int. Cl.³ H04H *5/00*; H03D *3/00*

U.S. Cl. 179—1 GS **6 Claims**



1. An AM stereophonic demodulator circuit for use in an amplitude/angle modulation system, comprising first detector means for producing a stereophonic sum signal (L+R) from a received stereophonic signal; a second detector means for producing a stereophonic difference signal (L−R) from the received stereophonic signal, said second detector means including a separation compensating circuit; a demodulating matrix circuit connected to said first and second detector means for separating L and R channel signals from the stereophonic sum and difference signals; and control means connected to said first and second detector means for extracting a DC signal proportional to an antenna input signal level from

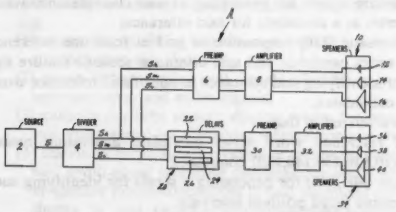
said first detector means and supplying the DC signal to said separation compensating circuit of said second detector means, said control means being adapted to control the gain and amplitude of said separation compensating circuit of said second detector means in accordance with the DC signal, whereby the stereophonic sum and difference signals are controlled to have the same amplitude for the antenna input signal level, wherein said control means includes a smoothing circuit connected to said first detector means for extracting a DC signal from said first detector means, an inverter connected to said smoothing circuit for producing a signal of the opposite phase to that of the DC signal in response to a low-frequency modulating signal appearing at an output of said smoothing circuit, and an adder connected to said smoothing circuit, said inverter and said second detector means for adding the output signal of said inverter to the output signal of said smoothing circuit so as to cancel the low-frequency modulating signal contained in the output signal of said smoothing circuit and thereafter supplying the DC signal from said smoothing circuit to said second detector means.

4,349,697

SOUND REPRODUCTION SYSTEM

Joseph Skabla, 2601 S. Kingshighway, St. Louis, Mo. 63139

Filed Mar. 26, 1980, Ser. No. 134,338
Int. Cl.³ H04R 3/14
U.S. Cl. 179—1 D **16 Claims**



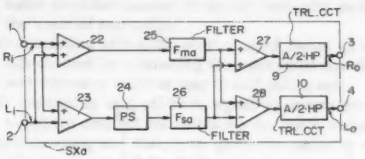
1. An apparatus for producing audible sound from an electrical audio signal containing various frequencies, said apparatus comprising: means for dividing the signal into low frequency, high frequency, and intermediate frequency components, with the low frequency component containing frequencies primarily below the intermediate frequency component, the high frequency component containing frequencies primarily above the intermediate frequency component, and the intermediate frequency component containing frequencies primarily above the low frequency component and primarily below the high frequency component; first speaker means for converting the components of the signal into primary audible sounds; delay means for delaying the individual components of the signal, with the high and intermediate frequency components being delayed longer than the low frequency component; and second speaker means for converting the delayed components into secondary audible sounds, the delay causing the secondary sounds emerging from the second speaker means to be out of phase with respect to the primary sounds emerging from the first speaker means, the delay being such that the out of phase secondary sounds imperceptibly prolong the primary sound such that the combined primary and secondary sounds simulate the acoustics of a fine music hall.

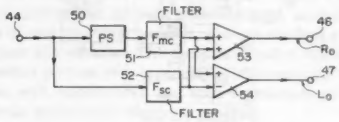
4,349,698

AUDIO SIGNAL TRANSLATION WITH NO DELAY ELEMENTS

Makoto Iwahara, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jun. 18, 1980, Ser. No. 160,543
Claims priority, application Japan, Jun. 19, 1979, 54-77275
Int. Cl.³ H04S 1/00, 5/00
U.S. Cl. 179—1 G **12 Claims**





3. An audio translator having a pair of first and second input terminals to which spatially correlated audio signals are respectively applied and a pair of first and second output terminals connected respectively to said first and second input terminals through first and second channels, comprising:

first and second adders each having a first input terminal and an output terminal connected in series in said first channel and each having a second input terminal connected to said second channel;

first and second subtracters each having a first input terminal and an output terminal connected in series in said second channel and each having a second input terminal connected to said first channel; and

filter circuit means connected in one of said first and second channels and having a transfer function which is the division of a first transfer function by a second transfer function, said first transfer function describing the relationship between the output of said first adder and a summation of signals delivered to said first and second output terminals and said second transfer function describing the relationship between the output of said first subtractor and a difference between signals delivered to said first and second output terminals.

11. A sonic localization network having an input terminal to which an audio signal is applied and a pair of first and second output terminals, comprising:

a first filter having a first transfer function providing a phase shift to the audio signal applied to said input terminal;

a second filter having a second transfer function providing a phase shift to the audio signal applied to said input terminal;

an adder for providing an output signal representing a summation of the output signals of said first and second filters to said first output terminal; and

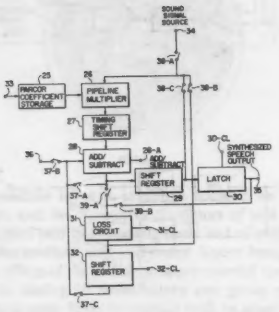
a subtractor for providing an output signal representing a difference between said output signals of said first and second filters to said second output terminal.

4,349,699

SPEECH SYNTHESIZER

Akihiro Asada, Yokohama; Kazuo Nakata, Kodaira; Kazuhiro Umemura, Yokohama; Hirokazu Sato, Yokosuka; Kenya Murakami, Yokosuka, and Kiyoshi Into, Yokosuka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Sep. 30, 1980, Ser. No. 192,539
Claims priority, application Japan, Oct. 1, 1979, 54-125384
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SM 2 Claims



1. A speech synthesizer comprising:

a first memory for storing partial autocorrelation coefficient and amplitude information derived from a frequency spectrum of a speech signal;

a multiplier having a pair of input terminals and an output terminal, an output signal of said first memory being applied to a first one of said pair of input terminals of said multiplier,

an adder/subtractor having a pair of input terminals and an output terminal, an output signal of said multiplier being applied to a first one of said pair of input terminals of said adder/subtractor,

a shift register adapted to receive an output signal of said adder/subtractor,

a latch circuit adapted to receive an output signal of said shift register and having a control terminal for controlling read-in of an input signal thereto,

a first switch for selecting either the output signal of said adder/subtractor or the output signal of said latch circuit,

a loss circuit for multiplying a constant to the output signal selected by said first switch,

a second memory for storing an output signal of said loss circuit,

a second switch for selecting either one of an input signal, the output signal of said shift register or the output signal of said loss circuit for supplying the selected signal to a second one of said pair of input terminals of said multiplier,

means for supplying the output signal of said adder/subtractor and an output signal of said second memory to a second one of said pair of input terminals of said adder/subtractor, and

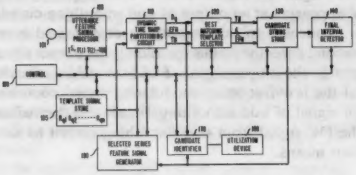
means for supplying the output signal of said latch circuit to an output terminal.

4,349,700

CONTINUOUS SPEECH RECOGNITION SYSTEM

Frank C. Pirz, Madison, and Lawrence R. Rabiner, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 8, 1980, Ser. No. 138,647
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SD 25 Claims



1. Apparatus for recognizing continuous speech comprising:

means (105) for storing signals representative of the acoustic features of a set of reference words;

means (103) responsive to an unknown utterance for producing a sequence of signals representative of the acoustic features of the utterance;

means (110,120,130,140,160) responsive to the reference word acoustic feature signals and the utterance acoustic feature signals for generating at least one reference word series as a candidate for said utterance;

and means (170) responsive to said at least one reference word series candidate and said utterance acoustic feature signals for identifying said utterance as one of said reference word series candidates;

characterized in that

said reference word series candidate generating means (110,120,130,140,160) comprises;

means (401,340) for generating a signal for identifying successive word position intervals;

means (307,309,311) operative in each successive word position interval for forming reference word series partial candidates including means (307,309,311,320.345) responsive to each reference word series partial candidate of the preceding word position for determining for each reference word a plurality of utterance segments beginning within a predetermined range of the utterance segment endpoint of said preceding word position reference word series partial candidate and corresponding to the reference word feature signals, said range overlapping the preceding word position partial candidate utterance segment endpoint;

means (307,320) responsive to each reference word feature signals and the feature signals of the corresponding determined utterance segments for forming a signal representative of the similarity between said reference word and said utterance segments;

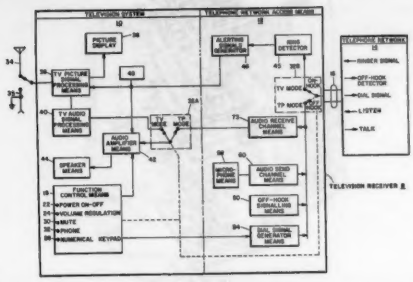
means (309,325) responsive to said similarity signals for selecting reference words having a prescribed similarity to their corresponding utterance segments;

and means (311) for combining said selected reference words with the reference word series partial candidates of the preceding word position to form at least one reference word series partial candidate for said word position interval.

4,349,701
TELEVISION RECEIVER WITH TWO-WAY TELEPHONE CONVERSATION AND DIAL-OUT CAPABILITIES

Paul A. Snopko, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Division of Ser. No. 109,424, Jan. 2, 1980. This application Aug. 5, 1980, Ser. No. 175,456
Int. Cl.³ H04M *11/08*
U.S. Cl. 179—2 TV 1 Claim



1. A television receiver comprising a cabinet which houses a television system having telephone network access means, said receiver providing both for presentation of television programs and for dialing out and conversing through the talk channel and listen channel of an embodied telephone network while viewing a television picture, said television receiver having function control means including operational mode selection means for providing a television program mode, and alternately, a two-way-telephone-conversation-with-television-picture mode with dial out;

A. said television system of said television receiver comprising:

(1) means for receiving broadcast or cable-carried television program signals;

(2) means for processing said signals effective to provide separate video and audio signals;

(3) cathode ray tube picture display means for receiving said video signal for displaying a television picture; and

(4) television audio signal processing means for receiving said audio-signal including dual-function audio amplifier-speaker means connectible to said telephone network during to said two-way-conversation-with-television-picture mode with dial out;

B. said telephone network access means of said television receiver comprising:

(1) a ring detector means and an alerting signals generator means for detecting a ringer signal received from said telephone network and generating a visible and/or audible alerting signal;

(2) off-hook signaling means for providing an off-hook signal to the telephone network;

(3) microphone means for sensing user voice signals during a telephone conversation;

(4) audio send channel means for receiving and amplifying the output of said microphone means for routing to said talk channel of the telephone network; and

(5) audio receive channel means for accepting the listen signal from said telephone network for routing to audio amplifier-speaker means in said television system;

(6) dial signal generator means for providing direct access loop-disconnect dialing through said telephone network;

C. said function control means of said television receiver comprising:

(1) first means for routing, when said receiver is in said television program mode, and when said receiver is in an ON-hook condition, said TV audio signal processing means to said audio amplifier-speaker means for reproducing the audio portion of the television program signal;

(2) second means for muting said television program when said function control means is operated to place the receiver in said two-way-telephone conversation-with-television-picture mode with said dial out, and when said telephone network is in an off-hook condition, said second means also providing for

(a) connecting said audio receive channel means to said listen channel for accepting caller voice audio signals;

(b) connecting said audio receive channel means to said audio amplifier-speaker means for rendering audible the voice of said caller;

(c) connecting said audio send channel means to said talk channel for conducting the voice audio signals of said television receiver user to said caller; and,

(d) connecting said off-hook signalling means to the telephone network for indicating the line is in use;

(e) connecting said dial signal generator means to said telephone network for dialing out through said telephone network;

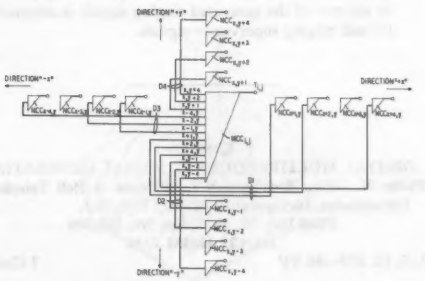
(3) volume regulating means for regulating volume of said audio amplifier-speaker means;

such that the television receiver user can initiate a telephone call by dialing out through said telephone network access means of said television receiver, and can conduct a two-way telephone conversation with the person called while viewing the picture portion of a broadcast or cable-carried television picture with muted audio, and upon termination of said conversation, restore said television program.

4,349,702
NODAL SWITCHING NETWORK WITH BINARY ORDER LINKS

Amos E. Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 12, 1978, Ser. No. 905,214
Int. Cl.² H04Q *3/42*
U.S. Cl. 179—18 GE 11 Claims



1. A nodal switching system having a plurality of switching nodes interconnectable by a network of link groups having lengths ordered according to increasing powers of a finite integer base, comprising:

means for registering the coordinate distances in said network between calling and called ones of said nodes;

means controlled by said registering means for identifying a link spanning the most of the distance in each of a pair of coordinate directions between said calling and called ones of said nodes;

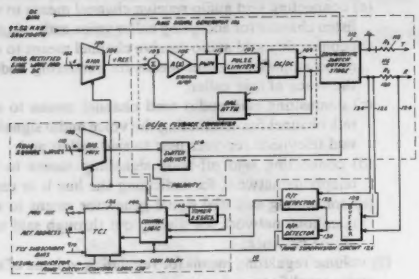
means for testing and seizing an idle one of the said identified links in one of said coordinate directions; and

means operative when there is no said idle one of said links for testing and seizing an idle link spanning the next longest distance in said one of said coordinate directions.

4,349,703
PROGRAMMABLE RING SIGNAL GENERATOR

Ramon C. W. Chea, Jr., Monroe, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,755
Int. Cl.³ H04M 3/02, 19/02
U.S. Cl. 179—18 HB 12 Claims



1. A digitally controlled ring signal generator comprising:

ring signal generation circuit means for selectively amplifying at least a plurality of multi-frequency ringing signals for providing immediate ringing to one or more subscriber lines;

loop current sensing means for sensing loop current;

ring supervision circuit means responsive to said loop current sensing means for generating ringing supervisory signals;

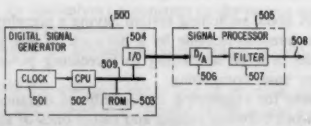
ring circuit control logic means responsive to said ringing supervisory signals and to an external data input, for generating an output control signal; and

a ring signal reference source for coupling multi-frequency ringing signals to said ring signal generation circuit means in response to said output control signal, such that the characteristics of said ringing signals are selectable in accordance with said external data input and the presence or absence of the generated ringing signals is determined by said ringing supervisory signals.

4,349,704
DIGITAL MULTIFREQUENCY SIGNAL GENERATOR

Philip W. Gillis, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1979, Ser. No. 108,849
Int. Cl.³ H04M 1/50
U.S. Cl. 179—84 VF 7 Claims



1. Apparatus for generating a multifrequency signal having a plurality of tones comprising

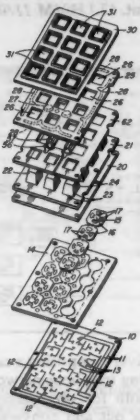
means for outputting digital signal representations of the amplitude values of at least one of said tones at a predetermined rate; and being characterized by

means for controlling said predetermined rate to be less than the Nyquist rate of the tone having the highest frequency in said multifrequency signal.

4,349,705
LIGHTED TELEPHONE DIAL

Gerd Kuhfus, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 6, 1981, Ser. No. 260,889
Int. Cl.³ H04M 1/22
U.S. Cl. 179—90 L 6 Claims



1. A light telephone dial of the pushbutton type, comprising;

a printed circuit board having a conductor pattern on a top surface of the board, the conductor pattern defining a plurality of switch positions, each position having a plurality of contact areas;

a switch member on said printed circuit board and having a plurality of switches, a switch aligned with each of said switch positions, each switch having a plurality of cantilever contacts members, a member aligned with each contact area;

a pushbutton member on said switch member and having a plurality of translucent cantilevered pushbuttons, a button aligned with each switch, the switch positions, switches and buttons arranged in four rows and three columns;

a translucent light guide plate positioned over said pushbutton member and having a plurality of apertures, an aperture for each pushbutton, the pushbuttons extending up through the apertures;

four recesses in a lower surface of the light guide plate, a recess at each intersection between a top row and the columns and between a bottom row and the columns, each recess positioned between four adjacent apertures;

grooves in the lower surface of the light guide plate, one along each of the top and bottom edges and at least one along each of the side edges, projections in the grooves extending in towards the spaces between rows and columns and having rearwardly inclined inner surfaces to present pointed ends towards said recesses, outwardly and rearwardly inclined surfaces behind said projections, an inclined surface on each side of a center line through a said pointed end, and further portions extending from said inclined surfaces parallel to said edges;

a light emitting diode positioned in each of said recesses, and means for supplying electrical power to the diodes;

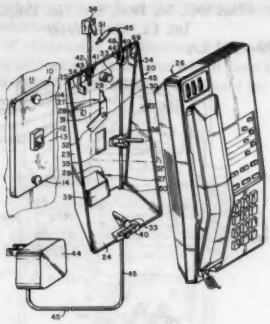
the arrangement such that light from the diodes travels through the light-guide plate, part of the light transferred directly from the plate to the pushbuttons, that part of the light passing between apertures entering said grooves in said light-guide plate and being deflected sideways along the grooves and re-entering the light-guide plate to transfer to the pushbuttons, the pushbuttons illuminated on all sides.

4,349,706

WALL MOUNTING ADAPTOR FOR TELEPHONE SET

Joseph Thompson, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 25, 1980, Ser. No. 143,617
Int. Cl.³ H04M 1/04
U.S. Cl. 179—100 C 12 Claims



1. A wall mounting adaptor for a telephone set, comprising:
an open shallow box-like housing having a back, two sides, top and bottom;
means in said back for attaching the housing to a telephone wall outlet;
a first latch pivotally mounted on said housing for releasably retaining the housing attached to the telephone wall outlet;
first retaining means on said housing for retention of a telephone line cord;
attachment means on said housing for attaching a telephone set to said housing, said attachment means interengaging with a base of a telephone set and comprising headed studs projecting forward from said back of said housing, each stud including a head portion and a stem for entrance through and positioning in a key-hole shaped aperture in the base of the telephone set;
a second latch on said housing for releasable engagement with said telephone set for releasably retaining said telephone set attached to said housing, said second latch including at least one forward extending projection for engagement with an aperture in said base; and
an aperture in said back for passage of said line cord plug therethrough for insertion in a jack in said telephone wall outlet.

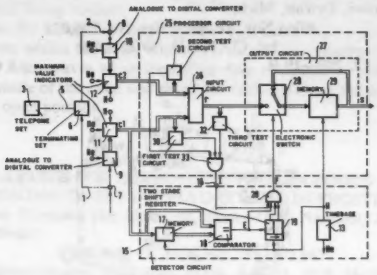
4,349,707

SYSTEM FOR MEASURING THE ATTENUATION ON A TRANSMISSION PATH

Claude Perrigault, Grenoble, and Jean-Claude Spiteri, Palaiseau, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 29, 1980, Ser. No. 201,690
Claims priority, application France, Oct. 31, 1979, 79 27010
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.31 R 11 Claims

1. A system for measuring the attenuation on a transmission path for a random signal in which the propagation time of said signal is between a lower limit T1 and an upper limit T2, the system comprising:
a first maximum value indicator circuit with immediate response and a holding time not less than T2, to which the signal at the input end of said path is applied;
a second maximum value indicator circuit with immediate response and a holding time not less than T2−T1, to which the signal at the output end of said path is applied;
a detector which detects that the output of said first indicator has been maintained constant during a time interval not less than T2, connected to receive the output signal from said first indicator and determining times at which the indicator output signals are recognized; and



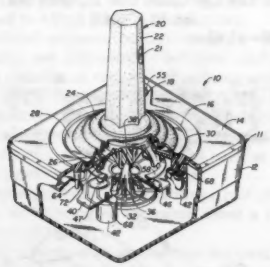
a processor connected to receive the indicator output signals, controlled by said detector and generating a measurement signal which is a function of the instantaneous value of the ratio of the indicator output signals at the times at which said signals are recognized.

4,349,708

JOYSTICK CONTROL

James C. Asher, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Aug. 22, 1979, Ser. No. 69,015
Int. Cl.³ H01H 25/04
U.S. Cl. 200—6 A 18 Claims

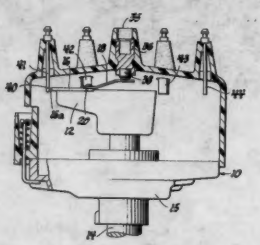


1. A joystick controller for selectively generating switch closures comprising;
an elongate handle moveable radially with respect to its axis about an axial pivot location from a nominal rest position;
a plurality of pressure-actuated switches disposed in a common plane normal to the axis of the handle in its rest position and circumscribing the axis of the handle in its rest position; and
a deformable resilient annular member superimposed over the switches, said annular member being attached to the handle at spaced locations intermediate the respective locations of the switches so that displacement of the handle from its rest position causes an arcuate portion of the annular member to be pressed against and actuate at least one of the switches.

4,349,709
RADIO FREQUENCY INTERFERENCE SUPPRESSING IGNITION DISTRIBUTOR

Adolph L. Micheli, Mt. Clemens, and Wey-Chaung Kuo, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1980, Ser. No. 206,021
Int. Cl.³ H01H 19/00, 1/00
U.S. Cl. 200—19 R 5 Claims

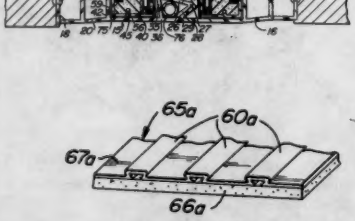


2. In an ignition distributor of the type wherein a movable electrode electrically connected to the secondary winding of an ignition coil is passed in ignition spark gap relationship with at least one stationary electrode electrically connected to a corresponding spark plug, the improvement wherein either the movable electrode or each stationary electrode is formed of a ceramic composition selected from the group consisting of (a) Fe_2O_3 doped with TiO_2 and (b) TiO_2 doped with any one or more of Nb_2O_5, Sb_2O_5 or Ta_2O_5, said composition having a resistivity suitable for suppressing radio frequency interference energy generated by an ignition spark.

4,349,710
DOOR EDGE FOR ATTACHMENT TO A TRAIN DOOR AND THE LIKE

Norman K. Miller, 2B Governor Markham Dr., Glen Mills, Pa. 19342

Continuation-in-part of Ser. No. 19,428, Mar. 12, 1979, Pat. No. 4,273,974. This application Dec. 15, 1980, Ser. No. 216,775
Int. Cl.³ H01H 3/16
U.S. Cl. 200—61.43 13 Claims

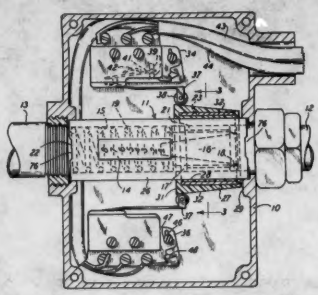


11. A pressure sensitive switch construction comprising a resiliently compressible intermediate member having through openings, flexible conductive sheets on opposite sides of said intermediate member in facing relation through said openings, and outer cushions externally of said conductive sheets and deflectible to flex said conductive sheets into engagement with each other through said openings, at least one of said conductive sheets comprising a flexible backing, and a flexible facing having a multitude of folds and secured in facing relation to said backing throughout its facing surface excepting said folds being unsecured, said one conductive sheet being flexible with flexure of said facing being taken up by said folds for minimum internal strain and enhanced life.

4,349,711
FLUID FLOW DEVICE

Jack E. Lake, Racine, Wis., assignor to Racine Federated, Inc., Racine, Wis.

Filed Oct. 14, 1980, Ser. No. 196,857
Int. Cl.³ G01F 1/00
U.S. Cl. 200—153 LA 7 Claims



1. In a fluid flow device, a housing having a fluid inlet and a fluid outlet and a fluid chamber intermediate said inlet and said outlet, a piston movably disposed in said chamber in accordance with fluid flow in said chamber, a spring in said chamber and in abutment with said piston for urging said piston in one direction, a magnet attached to said piston for movement with said piston, a magnetic follower piloted on the exterior of said housing for movement with the movement of said magnet, an electric switch mounted on said housing and including an actuating arm and a spring urging upon said arm and with the extending end of said arm being in the path of movement of said follower and spring-urged into the path of movement of said follower for actuation of said switch in response to movement of said follower, an electric element electrically connected with said switch for actuation by said switch, the improvement comprising said switch arm extending end being in contact with said magentic follower when said piston is in said one direction, said magnetic follower having a uniformly inclined ramp surface aligned with said switch arm and in constant contact with said switch arm extending end for movement of said switch arm upon movement of said magnetic follower and swinging said switch arm in proportion to the movement of said magnetic follower to to thereby actuate said switch only when said magnetic follower moves to a selected location relative to said housing.

4,349,712
PUSH-BUTTON SWITCH

Dieter Michalski, Berlin, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,792
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902769
Int. Cl.³ H01H 13/04
U.S. Cl. 200—159 B 1 Claim

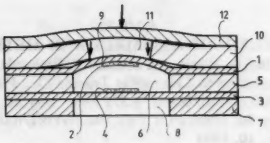
1. A push-button switch comprising:
- a bottom layer of rigid insulating material, said bottom layer having a plurality of openings therethrough extending from the top to the bottom surface thereof,
- a first base layer of resilient and flexible plastic arranged on the bottom layer;
- a plurality of electrically conductive contacts supported on the side of said base layer which faces away from said

bottom layer, each contact in register with at least one different opening in said bottom layer;

an intermediate layer of rigid insulating material having a plurality of openings therethrough extending from the top to the bottom surface thereof and said intermediate layer being arranged on the contact side of said base layer with each opening in said intermediate layer in register with at least one different contact on said base layer;

a second base layer of resilient and flexible plastic arranged on said intermediate layer;

a plurality of electrically conductive contacts supported on the side of said second base layer which faces said contacts on said first base layer with each contact on said second



base layer in register with a corresponding contact on said first base layer; and,

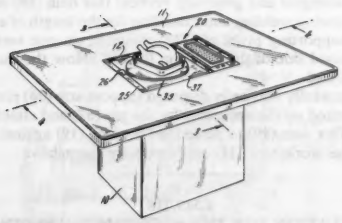
wherein the portions of said second base layer overlying said openings thereunder are domed with a convex curved surface to provide snappable surfaces, wherein inwardly deflection of said domed surfaces provides electrical engagement of the corresponding contacts in register therewith and a corresponding inward deflection of the portions of said first base layer which overlie said openings in said bottom layer, and wherein all adjacent ones of said openings are separated by respective portions of rigid bottom and intermediate layers whereby the portions of said base layers between adjacent openings are firmly clamped in position.

4,349,713

COMBINED COOKING AND SERVING MICROWAVE APPARATUS

Herman Marsen, 201 W. 86 St., New York, N.Y. 10024

Filed Feb. 19, 1980, Ser. No. 122,114
Int. Cl.³ H05B *6/80*
U.S. Cl. 219—10.55 A **4 Claims**



1. A combined cooking and serving microwave apparatus comprising:

a tabletop having a central opening therein and hollow support means extending downwardly from the central opening,

means within said hollow support for retaining a microwave oven thereon with the top portion of the microwave oven below the level of the tabletop,

said microwave oven having a control panel in the top portion thereof which is accessible through the opening of said tabletop,

door means on the microwave oven at the top portion thereof, said door means being operable to open and close the oven by a horizontal sliding motion,

said tabletop being constructed and arranged to accommodate the sliding door,

tray means within said oven for holding an article of food being cooked,

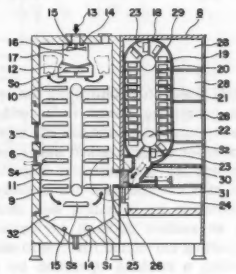
means for lifting and lowering said tray means from a position deep within the oven where it is adapted to be surrounded by microwaves when the sliding door is closed to a position outside of the oven and above the tabletop when the door is in open position.

4,349,714

APPARATUS FOR DEFROSTING FROZEN FOODS AND CONTINUOUSLY SUPPLYING SAME DEFROSTED

Tokuo Tamano, 148, Ikomadai, Ikoma-City, Naraken, Japan (630-02)

Filed Aug. 14, 1980, Ser. No. 177,967
Claims priority, application Japan, Aug. 11, 1979, 54-102613
Int. Cl.³ H05B *6/80*
U.S. Cl. 219—10.55 A **4 Claims**



1. An apparatus for storing and then defrosting frozen items comprising:

a first cabinet having a plurality of trays on an endless conveyor for individually supporting frozen food items and maintained at a food freezing temperature,

a second cabinet adjacent the first cabinet in which frozen foods items are individually defrosted and supporting therein a plurality of trays on an endless conveyor,

means for transferring food items from a tray in the first cabinet directly to a tray in the second cabinet,

means for moving the conveyor in the second cabinet to position the tray with the transferred items at a predetermined location in the second cabinet,

means in said second cabinet comprising a pair of removable members for forming an enclosure about a tray at said predetermined location,

means for irradiating with microwaves the food items on a tray within said enclosure,

means for moving the tray with the defrosted food item to a dispensing opening in said second cabinet.

4,349,715

CASSETTE TAPE CONTROLLED MICROWAVE COOKING APPARATUS

Ryoiti Mariyama, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 18, 1980, Ser. No. 188,496
Claims priority, application Japan, Sep. 21, 1979, 54-122429
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **10 Claims**

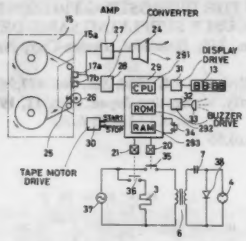
1. An automatic and manual microwave oven for conducting a cooking operation and providing audible cooking instructions comprising:

a housing including an oven cavity and a cavity closure door;

microwave generating means for supplying microwave energy to said oven cavity for performing a cooking operation;

a cassette tape player system for reproducing information recorded on a cassette tape, said cassette tape carrying audio information for providing an audible cooking explanation and digital data for controlling the operation of said microwave generating means;

an audio system for generating the audible cooking explanation in accordance with the audio information reproduced by said cassette tape player system;



a digital control system for controlling the operation of said microwave generating means in accordance with the digital data reproduced by said cassette tape player system to be operable for predetermined time intervals; and

tape drive means for intermittently imparting correlated rotation to said cassette tape for initially explaining a cooking operation by actuating said audio system for generating an audible cooking explanation and subsequently imparting correlated rotation to said cassette tape for controlling a cooking operation by actuating said digital control system for controlling the operation of the microwave generating means.

4,349,716

MECHANICAL CONTROL HEAD FOR GUIDING THE MOVEMENT OF A TOOL, PARTICULARLY OF AN ELECTRODE ADAPTED TO MAKE A CAVITY IN A METAL PIECE, BY ELECTROEROSION

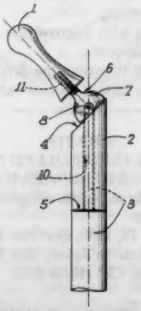
Learco Di Piazza, Ispra, Italy, assignor to European Atomic Energy Community (EURATOM), Luxemburg, Luxembourg

Filed Dec. 9, 1980, Ser. No. 214,768

Claims priority, application Luxembourg, Dec. 14, 1979, 81995

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 E **4 Claims**



1. A mechanical control head comprising:

a guided tool for the removal of material from a workpiece by electroerosion;

said tool being mounted on a spatula shaped foot having a tapered edge, said foot being pivotally mounted to one end of a control rod having an annular shoulder spaced from said one end;

a guide prism coaxially disposed about said control rod between said annular shoulder and said one end; the guide prism having a guide face adjacent said tapered edge;

said guide prism and said central rod being mounted for rotational movement in relation to each other so that either one may be rotated while the other is held stationary to cause said foot to follow a preselected course by constant movement over the guide face, thus correspondly moving the guided tool.

4,349,717

FLUX DAM ASSEMBLY AND METHOD

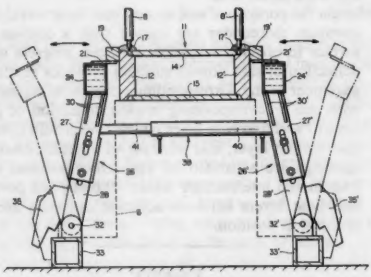
Edwin L. Lindow, Plano, and Bradley T. Richards, Oswego, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00667, § 371 Date May 30, 1980, § 102(e) Date May 30, 1980, PCT Pub. No. WO81/03454, PCT Pub. Date Dec. 10, 1981

PCT Filed May 30, 1980, Ser. No. 245,248

Int. Cl.³ B23K *9/18*

U.S. Cl. 219—73.2 **10 Claims**



1. In a submerged arc welding apparatus having a platform (6) for supporting a workpiece (11), a traveling welding head (8) mounted for movement with respect to the platform (6), and a flux dam (19) positionable adjacent to the workpiece (11) for retaining granular flux (17), the improvement comprising:

(a) an elongate and generally vertical flux dam (19) stationary during welding and extending for the length of a weld;

(b) a supporting pivot pin (32) mounted on one vertically disposed side of the platform (6) and below the flux dam (19); and

(c) a generally vertically disposed support arm (26) pivotally mounted on the apparatus by the pin (32) and attached to the flux dam (19) to place the flux dam (19) against a side of the workpiece (11) and vertically thereabove.

4,349,718

INSTALLATION FOR THE RESISTANCE-WELDING OF STRUCTURAL PARTS

Martin Carota, Neugermering; Josef Slootz, Eching; Klaus Weiser, Kottgeisering; Peter Gulich, Puchheim, and Milenko Jovanovic, Augsburg, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,391

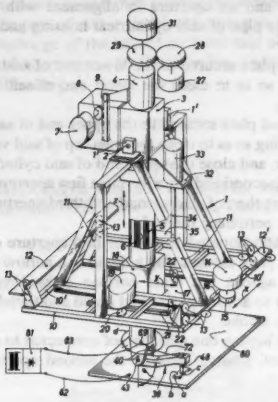
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717453

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—78.01 **28 Claims**

1. An installation for the resistance welding of structural

parts, comprising a half-tong means and a welding electrode secured at the half-tong means, characterized in that the half-tong means is arranged for pivotal movement, and characterized by a pivotal mounting means, a tubular support member rotatably supported on the mounting means, the half-tong means being pivotally supported at the end of the tubular



support member, a drive shaft having an axis and being rotatably supported in the tubular support member, said drive shaft and said tubular support member each including rotary drive means, and said drive shaft being operable to pivot the half-tong means supported at the end of the tubular support member about an axis extending transversely to the axis of said drive shaft.

4,349,719

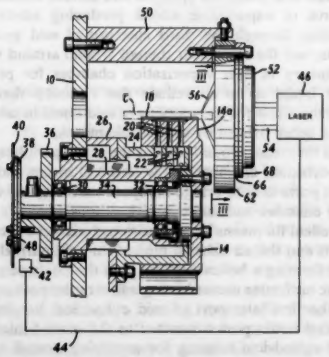
APPARATUS FOR LASER PERFORATION OF TRANSPORTED ARTICLES

Ernest Cashwell, Richmond; Everett C. Grollimund, Midlothian, both of Va.; Walter W. Duley, King City, Canada; A. Clifton Lilly, Jr., Richmond, Va.; Warren E. Claflin, Bon Air, Va.; Edward B. Stultz, and Peter Martin, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 908,523, May 22, 1978. This application Jun. 16, 1980, Ser. No. 159,593

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LK **11 Claims**



1. Apparatus for providing perforations extending through and spaced about the other peripheral surface of a cigarette, said apparatus comprising light energy generator means for generating a light beam, rotative transport means for transporting the cigarette, said rotative transport means contacting the cigarette only at a portion of the cigarette distinct from the portion thereof to be perforated, and optical means for receiving a light beam generated by said light energy generator means, for splitting said light beam reflectively and non-transmissively into a plurality of spatially separated parts, and for conducting said separated parts thereof in respective different light paths intersecting respective different predetermined locations spaced about the outer peripheral surface of the cigarette to perforate the cigarette as said rotative transport means moves the cigarette through a predetermined position.

4,349,720

COUPLING ARRANGEMENT FOR A WELDING APPARATUS

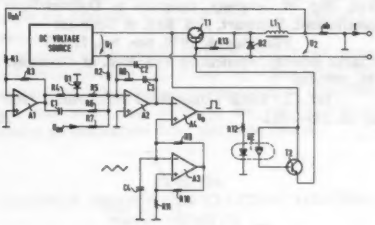
Toivo T. Mäkimaa, Lahti, Finland, assignor to Kemppi Oy, Lahti, Finland

Filed Dec. 5, 1979, Ser. No. 100,645

Claims priority, application Finland, Dec. 8, 1978, 783784

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—130.33 **6 Claims**



1. In a power supply coupling arrangement for a welding apparatus of a type suitable for MIG-welding, and which operates under conditions whereby at certain times a short-circuit occurs at the load and at other times an open-circuit occurs at the load, which arrangement includes a controllable electrical power source capable of supplying the current taken by the load over a given load voltage range, a first electrical circuit means that detects the current taken by the load and establishes an electrical signal corresponding to such load current, and a second electrical circuit means that detects the voltage applied to the load and establishes an electrical signal corresponding to such load voltage, the improvement which comprises in combination a third electrical circuit means coupled to said first and second electrical circuit means to receive therefrom said load current signal and said load voltage signal, and coupled to said electrical power source to control the current and voltage delivered to the load thereby in accordance with said load current and load voltage signals and predetermined response characteristics established by circuit elements of said third electrical circuit means, said response characteristics being such as to provide a given incremental step in the current delivered to the load and a prescribed rate of increase of said current in response to the occurence of a short-circuit at the load, said third electrical circuit means including a transistor connected in series with the load to regulate the current flow thereto, and a pulse-width modulator responsive to said load voltage and current signals and responsive to a command input signal to establish a pulse sequence output signal in which the pulse-width is determined by the instantaneous values of said load voltage and current signals and by said command input signal, said pulse sequence output signal being utilized to control the effective conductivity through said transistor.

4,349,721

COATED WELDING ELECTRODE OF BASIC TYPE SUITABLE FOR VERTICAL DOWN WELDING OF PIPES

Henricus Mentink, and Hendrikus van Rooijen, both of Utrecht, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,534

Claims priority, application Netherlands, Nov. 9, 1979, 7908212

Int. Cl.³ B23K *35/36*

U.S. Cl. 219—145.23 **3 Claims**

1. A welding rod comprising a core wire having a coating; said coating containing by weight on a dry basis 22 to 28% of calcium carbonate, 1.5 to 3% calcium fluoride, 7 to 14% of titanium dioxide, 35 to 55% of iron, and 5 to 25% of at least one element selected from the group consisting of chromium, manganese, silicon, nickel and molybdenum; the ratio of the diameter of the coated welding rod to the diameter of the core wire being between 1.45:1 and 1.70:1.

4,349,722

MOISTURE PROTECTION AND DRAINAGE ARRANGEMENT FOR MOTOR VEHICLE CLOSURE LOCKS

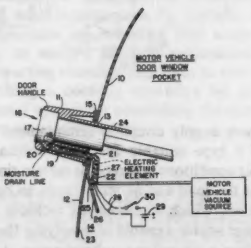
Hermann W. Kurth, and Rolf Krügener, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,461

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840410

Int. Cl.³ E05B *17/00*; B60J *5/00*; H05B *3/00*

U.S. Cl. 219—202 **21 Claims**



1. In combination with a hollow closure of a motor vehicle, a lock, the lock including a lock cylinder operatively mounted on the closure, and a drain opening means at a lower portion of the lock cylinder, means in communication with an interior of the lock cylinder for draining moisture from the interior, characterized in that a drain line means is connected to the drain opening means, means are provided for guiding the drain line means from the drain opening means to an interior portion of the hollow closure, and in that the drain line means terminates in a drain section disposed in an essentially vertical plane within the closure.

4,349,723

ELECTRICALLY HEATED NON-TOXIC SMOKE GENERATOR

Edmund Swiatosz, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1980, Ser. No. 137,227

Int. Cl.³ H05B *1/00*; F22B *27/00*; B01F *13/00*

U.S. Cl. 219—271 **13 Claims**

1. An apparatus for producing nontoxic smoke comprising in combination:

an open-ended cylindrical housing vertically orientated so as to have an upper end and a lower end;

said cylindrical housing having a pair of air inlet ports located near the upper end thereof, an air exhaust pipe located near the lower end thereof, and a smoke discharge pipe located near the lower end thereof;

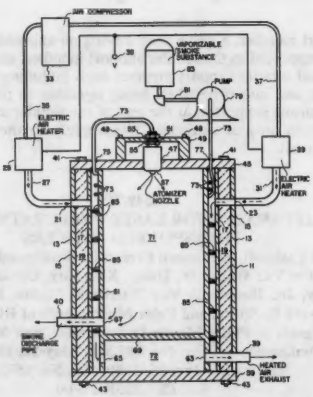
means defining a vaporization chamber mounted within and spaced from said cylindrical housing, said vaporization chamber having an inner surface, an open top and closed bottom, and an aperture in alignment with the smoke discharge pipe of said cylindrical housing and connected thereto;

a first end plate secured to the lower end of said cylindrical housing so as to close the lower end of said cylindrical housing;

a second end plate secured to the upper end of said cylindrical housing so as to close the open top of said vaporization chamber, and close the upper end of said cylindrical housing, said second end plate having a first aperture located in the center thereof, and second and third apertures located near the periphery thereof;

nozzle means mounted within the first aperture of said second end plate for spraying a liquid in a hollow cone spray pattern against the inner surface of said vaporization chamber so as to vaporize said liquid and thereby produce nontoxic smoke;

coil means having one end thereof connected to said nozzle means and passing through the second aperture of said



second end plate, the opposite end thereof connected to a source of vaporizable smoke producing substance and passing through the third aperture of said second end plate, and the remainder thereof wound around the outer periphery of said vaporization chamber for preheating said liquid so as to reduce the viscosity thereof and thereby allow for the spraying of said liquid in said hollow cone spray pattern by said nozzle means;

helical fin means wound around the outer periphery of said vaporization chamber below said coil means and said air inlet ports so as to bridge the space between said vaporization chamber and said cylindrical housing;

said helical fin means being positioned between the air inlet ports and the air exhaust pipe of said cylindrical housing and forming a helical airflow path therebetween;

electric air heater means having a first outlet port connected to the first inlet port of said cylindrical housing and a second outlet port connected to the second inlet port of said cylindrical housing for supplying heated air under pressure through the first and second inlet ports of said cylindrical housing to said helical airflow path between said cylindrical housing and said vaporization chamber;

said air heater means being adapted for supplying the heated air at a temperature sufficient to heat said vaporization

chamber to a temperature above the vaporization temperature of the liquid being vaporized;

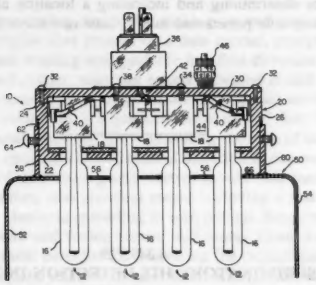
said helical fin means being adapted for circulating the heated air supplied thereto by said air heater means around the periphery of said vaporization chamber so as to provide for a maximum heat transfer rate to said vaporization chamber, and then passing the heated air to the air exhaust pipe of said cylindrical housing so as to allow for the discharge of the heated air from said nontoxic smoke producing apparatus by the air exhaust pipe of said cylindrical housing.

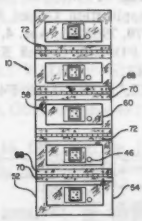
4,349,724

ARTICULATE RADIANT HEATER MODULE

Russell Ellersick, 7925 Twin Oaks Dr., Citrus Heights, Calif. 95610

Filed Nov. 7, 1980, Ser. No. 204,760
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—347 **6 Claims**





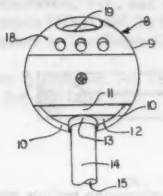
1. A radiant heating module comprising a box-shaped housing having a bottom wall, a pair of opposed parallel end walls, a front wall, a back wall and a removable top cover plate, one of said walls having a plurality of openings, a plurality of lamp sockets attached to the bottom side of the top cover wall, each socket being disposed within said housing, each of said sockets being aligned with one of said openings to permit lamp placement in said sockets, a lamp in each of said sockets, said lamp extending axially from said socket through its respective aperture to a position outside of said housing means connecting the lamp sockets to a source of electrical current: a reflector removably secured to the housing having a first wall parallel to and spaced from the wall of said housing having the plurality of openings: said reflectors first wall also having a plurality of openings therein, each of which openings is axially aligned with the corresponding opening of the housings, said reflector also having parallel side walls and articulated connection means on said module for attaching one end of said module to one end of a similar module.

4,349,725

AIR DISPERSING HEAD FOR AIR HEATERS

John J. Sheridan, 2751 Virginia St., Shreveport, La. 71103

Filed Jun. 16, 1980, Ser. No. 159,614
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—373 **4 Claims**



1. An air dispersing head for an air heater comprising:

(a) a generally cylindrically-shaped cap means shaped for cooperation with the air discharge of said air heater and having an internal cavity and a primary air duct for introduction of ambient air into said cavity;

(b) hose means extending through said cap means on a side of said cap means opposite said primary air duct and into said cavity for directing heated air from said heater to a work area; and

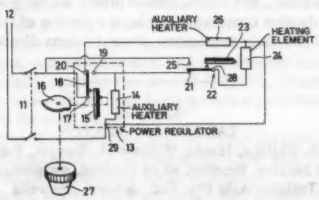
(c) a plurality of secondary air ducts in said cap means and located on the same side of said cap means as said primary air duct for controlling a secondary flow of ambient air into said cavity and adjusting the temperature of said heated air discharged from said hose means.

4,349,726

CONTROL DEVICE FOR ELECTRIC HEATING APPARATUS

Gerhard Gössler, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Electro-Geräte Blanc und Fischer, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,429
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951334
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—511 **10 Claims**



1. A control device for the heating system of an electric heating apparatus comprising:

a power regulator having a first temperature sensitive switch for periodically supplying electric power to the heating system;

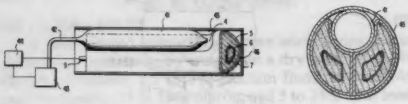
a second temperature sensitive switch connected for supplying unregulated power directly to the heating system in a first mode of operation until a given desired temperature is reached, and for supplying regulated power to the heating system from a first output of the regulator in a second mode of operation on reaching the desired temperature, reducing the power supplied to the heating system; and,

an auxiliary heating system connected to a second output of the regulator and in thermal engagement with the second temperature sensitive switch, for hastening the onset of the second mode of operation.

4,349,727
HEATER UNIT

John W. Churchill, Beverly, Mass., assignor to Southport Enterprises, Inc., Beverly, Mass.

Continuation-in-part of Ser. No. 382,295, Jul. 25, 1973, Pat. No. 3,982,099. This application Oct. 8, 1974, Ser. No. 513,140
Int. Cl.³ H05B 3/44
U.S. Cl. 219—544 24 Claims



1. A heater unit comprising resistor means, terminal means connected to the ends of said resistor means, first surrounding elongated metallic sheath means, compacted powder insulation material disposed within said first sheath means and spacing said resistor means from said first sheath means, said first sheath means being provided with indentation means extending along at least a portion of the length of said first sheath means, said first surrounding elongated metallic sheath means including at least one sheath in the form of two substantially parallel adjacent leg portions interconnected by a return bend portion formed of said one sheath bent back upon itself and being integral with the adjacent parallel extending leg portions, said terminal means being provided at the adjacent ends of said one sheath and having said resistor means connected therebetween, said resistor means extending in the direction of said one sheath and being spaced therefrom by said powder insulation material, each of said leg portions of said one sheath having in cross section, at least a first flat surface portion and arcuate surface portions forming a closed loop, said at least first flat surface portions of each leg portion being adjacent and facing one another, said indentation means extending along at least a portion of at least one of said leg portions, said resistor means being a resistor helix having a cross-sectional configuration generally corresponding to the cross-sectional configuration of said one sheath, said indentation means being formed as a groove bounded at least in part by generally facing surface portions of said first sheath means, temperature sensing means being disposed in said groove for sensing the temperature of the heater unit, and second sheath means encasing and in thermal conductive contact with at least a portion of both said leg portions and said temperature sensing means disposed in said groove.

4,349,728
TARGET APPARATUS

Robert B. Phillips, Hants; William H. Bowyer, Farnham, and Bruce Moxley, Reading, all of England, assignors to Australasian Training Aids Pty. Ltd., Albury, Australia

Filed Dec. 7, 1979, Ser. No. 101,191
Claims priority, application United Kingdom, Dec. 7, 1978, 47598/78
Int. Cl.³ G06F 15/20; F41J 5/12
U.S. Cl. 235—400 24 Claims

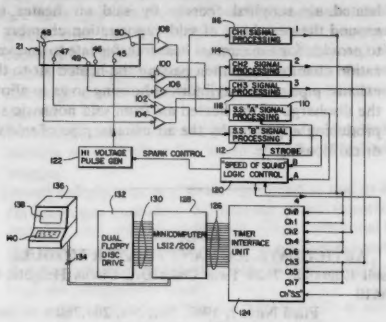
1. Target apparatus, comprising:

a framework;

at least one sheet of material, capable of being penetrated by a projectile, covering said framework to form a chamber;

a plurality of transducers for detecting shock or pressure waves in said chamber caused upon penetration of said at least one sheet of material by said projectile, said transducers being positioned at respective spaced-apart locations within said chamber and lying on only a portion of an arc of a circle lying in a region where said transducers are protected from being hit by said projectile;

means responsive to said transducers for measuring time differences between instants of detection of a shock or pressure wave by said transducers; and

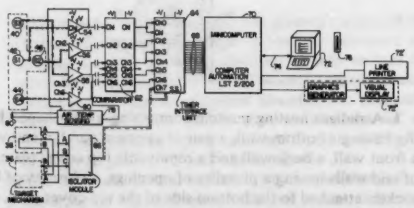


means responsive to said time difference measuring means for determining and indicating a location at which said projectile penetrated said at least one sheet of material.

4,349,729
DISCRIMINATORY HIT DETECTION IN TARGET APPARATUS

Lindsay C. Knight, Albury, Australia, assignor to Australasian Training Aids, Pty., Ltd., Albury, Australia

Filed Jan. 8, 1980, Ser. No. 110,356
Claims priority, application United Kingdom, Jan. 8, 1979, 7900626; Mar. 8, 1979, 7908261; Apr. 4, 1979, 7911721; Australia, May 14, 1979, PD8800; United Kingdom, Jul. 24, 1979, 7925668
Int. Cl.³ G06F 15/20; F41J 5/12
U.S. Cl. 235—400 19 Claims



1. Discriminatory hit detection apparatus for indicating when a target member has been hit by a projectile fired at said target member, comprising:

a target member;

transducer means spaced apart from and not physically connected to said target member for detecting and selectively providing a hit indication only in response to disturbance of said target member caused by said projectile hitting or passing through said target member and

means responsive to said transducer means output for providing said hit indication only in response to disturbance of said target member caused by said projectile hitting or passing through said target member.

4,349,730
DATA PROCESSING DEVICE FOR READING AND PROCESSING VISUALLY OBSERVABLE INFORMATION PRESENT ON A DATA CARRIER

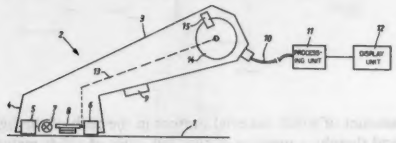
Josef Pfeifer, Unterhaching; Rudolf Paulus, Munich, and Eberhard Zieran, Grünwald, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,359

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910854

Int. Cl.³ G06K *9/04*

U.S. Cl. 235—472 **4 Claims**



1. A data processing device for picking up and processing visually observable data present on a data carrier, comprising a hand operated reading unit guidable in a first direction over the data on said carrier; scanning means provided in said reading unit for scanning point-by-point the data on said carrier in a second direction which is perpendicular to said first direction; timing means arranged for controlling the time of successive scanning operation in said second direction in dependence on the speed of said reading unit relative to said data carrier in said first direction; said scanning means including a matrix of photoelectric elements extending in said second direction and cooperating with said timing means; said timing means including a displacement detector for measuring the displacement of said reading means relative to said data carrier; and said displacement detector includes a sectional roller supported for rotation in said reading unit and being engageable with said data carrier and means for generating a control signal proportional to the instant speed of said sectional roller.

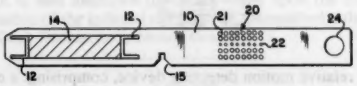
4,349,731
COMMODITY KEY WITH ON SITE ENCODING FEATURE

George J. Berner, Xenia, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jan. 16, 1980, Ser. No. 112,664

Int. Cl.³ G06K *21/00, 7/14*

U.S. Cl. 235—489 **4 Claims**



1. A commodity key for use in connection with radiation sensitive encoding devices to provide a unique pattern of radiation identifying the type and/or unit price of a commodity in a calculating device, said key comprising

an elongated body having an area for mounting a marking stamp and a code area formed of a plastic material which is locally frangible in response to localized pressure,

said code area having first and second flat opposite sides and being relatively thin in comparison to its width and length,

said code area having a first set of blind holes on the first side thereof and a second set of blind holes on the second side thereof aligned as pairs with said first set of holes whereby said material between pairs of holes provides a selectively removable radiation block,

such material being removable in response to pressure applied through one hole of a pair to permit on-site encoding of the commodity key with an appropriate tool.

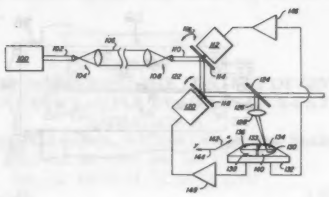
4,349,732
LASER SPATIAL STABILIZATION TRANSMISSION SYSTEM

Clyde M. Whitby, Duncanville, Tex., and Douglas L. White, deceased, late of Granada Hills, Calif. (by Elizabeth A. White, administrator), assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,070

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. In a light beam transmission system, an improvement for reducing translational and angular beam deviation errors, comprising:

(a) expansion means disposed near the beginning of the path of light beam transmission, for increasing the cross sectional area of the light beam to produce an expanded beam;

(b) said expansion means including a first lens having at least one convex surface and a first predetermined focal length, f_1, disposed in the path of the light beam and coaxial therewith, a second lens having at least one convex surface and a second predetermined focal length, f_2, disposed in the path of the light beam, downstream of said first lens, coaxial therewith, and at a distance therefrom substantially equal to the sum of f_1 and f_2, wherein the amount by which the light beam is expanded is substantially equal to the ratio f_2/f_1, a third lens having at least one convex surface and a third predetermined focal length, f_3, disposed in the path of said expanded light beam and coaxial therewith, and a fourth lens having at least one convex surface and a fourth predetermined focal length, f_4, disposed in the path of the light beam, downstream of said third lens, coaxial therewith, and at a distance therefrom substantially equal to the sum of f_3 and f_4, wherein the amount by which the light beam is reduced is substantially equal to the ratio f_3/f_4;

(c) reduction means disposed near the end of the path of light beam transmission for decreasing the cross sectional area of the beam to produce a reduced beam;

(d) correction means, disposed in the path of said reduced beam, for reducing angular deflection of said reduced beam from a desired reduced beam transmission axis;

(e) said correction means including detection means for detecting the deviation of said reduced beam from said desired transmission axis and producing an output signal representative thereof, and deflection means responsive to said detection means for deflecting said reduced beam in accordance with said output signal by an amount which substantially aligns it with said desired transmission axis;

(f) said detection including beam splitting means for splitting said reduced beam into two parts, a first and a second, and for directing said two parts in two different directions having a substantially fixed space relation;

(g) a lateral effect quadrant photodetector in the path of said second part of said reduced beam for detecting its position relative to a predetermined desired position and providing said output signal representative of said detected position;

(h) focus means for focusing said second part of said reduced beam onto said lateral effect quadrant photodetector; and

(i) amplifier means for amplifying said output signal to thereby improve said deflection correction.

4,349,733

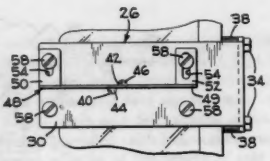
SUN TRACKER

Benjamin H. Beam, Sunnyvale, and Richard M. Beam, Los Altos, both of Calif., assignors to Beam Engineering, Inc., Sunnyvale, Calif.

Filed Jul. 3, 1980, Ser. No. 165,564

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—203 R **9 Claims**



1. A sun tracker comprising a base, first and second photoelectric sensors mounted on said base in spaced apart relation, a substantially opaque plate mounted on said base between said sensors, said plate having first and second faces and a thickness between said faces sufficient to obscure partially said sensors and expose a portion of said first sensor outward of said first face and a portion of said second sensor outward of said second face, said plate extending outward of said base so that when said base is oriented such that said plate points toward the sun said sensors are substantially uniformly illuminated, said first face being a reflective face that confronts said first sensor so as to effect illumination of said first sensor when said base is oriented so that illumination from the sun impinges on the tracker from a direction between said reflective face and said base, and means responsive to a magnitude of illumination of said first sensor that is greater than the magnitude of illumination of said second sensor for moving said base toward a position at which said plate points toward the sun, said base moving means being deactivated when said sensors are substantially equally illuminated.

4,349,734

FLOW DETECTOR FOR SOLIDS

Frank T. DiGuiseppi, Trenton, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Sep. 11, 1980, Ser. No. 186,107

Int. Cl.³ H01J *39/12*

U.S. Cl. 250—222 R **14 Claims**

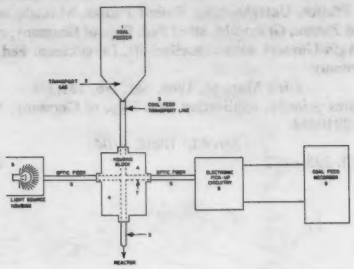
1. An apparatus for detecting and measuring flow rates of solids material under high pressure, comprising:

(a) a first continuous conduit for the passage of said solids material therethrough, said first conduit (solids conduit) connected in an airtight manner to a solids inlet line and a solids outlet line respectively, at opposite ends of said solids conduit, in order to maintain high pressure therein;

(b) a second continuous conduit for the passage of light therethrough, said second conduit (light conduit) intersecting and communicating with said solids conduit in an airtight manner, said light conduit sealed from the outside atmosphere by a light conductive means located within said light conduit at opposite sides of said solids conduit in order to maintain a high pressure therein;

(c) a light source for transmitting light through the light conducting means, with a portion of the light being interrupted by the solids material passing through said solids conduit; and

(d) means for measuring and registering the difference in light intensity within said light conduit before and after the light is interrupted by the solids material, the difference in light intensity representative of the difference in



amount of solids material present in the path of the light, and thereby a measure of the flow rates of solids material through the solids conduit.

4,349,735

VEHICLE HEIGHT DETECTING DEVICE

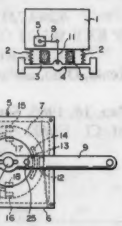
Koichi Maeda, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jun. 11, 1980, Ser. No. 158,385

Claims priority, application Japan, Jun. 20, 1979, 54/84672[U]

Int. Cl.³ B60G *17/00*

U.S. Cl. 260—229 **2 Claims**

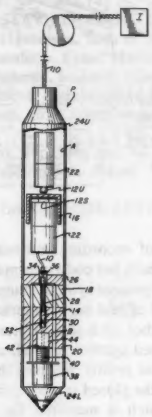


2. A relative motion detecting device, comprising: a casing, a rotatable member rotatable disposed in the casing member; a shaft secured to the rotatable member and projecting out of the casing member; a link arm provided outside of the casing member and connected to the shaft and adapted to be connected to a further element movable relative to the casing member; a detector means provided in the casing member for detecting the angular position of the rotatable member with respect to the casing member; retaining means consisting of a recess formed in one of said members and a projection formed on the other member and engagable in said recess, for blocking the rotation of the rotatable member when the rotatable member is displaced in one direction along the axis of the shaft; a spring biasing the rotatable member in said one direction; and a spacer plate removably interposed between the casing member and the link arm for preventing the rotatable member from the axial displacement in said one direction.

4,349,736
METHOD FOR LOCATING AND EVALUATING SUBSURFACE URANIUM DEPOSITS HAVING AN APPARENT GRADE OF UP TO APPROXIMATELY 5% CONTAINED U_3O_8

Bob R. Miller, 435 W. Fremont Dr., Littleton, Colo. 80123

Continuation-in-part of Ser. No. 842,596, Oct. 17, 1977, abandoned. This application Oct. 3, 1979, Ser. No. 81,453
Int. Cl.[3] G01D *18/00*; G01V *5/00*
U.S. Cl. 378—83 4 Claims



1. The method of locating and evaluating subsurface uranium-bearing ore bodies which comprises the steps of: independently determining the natural gamma radiation above approximately 60 Kev and above approximately 400 Kev emanating from an unknown radioactive formation to establish a ratio thereof, comparing said ratio and the apparent grade of uranium represented thereby with a similarly derived ratio and actual grade determined from a known uranium-bearing ore body in radiometric equilibrium to ascertain if a condition of apparent disequilibrium exists in the unknown formation, irradiating the unknown formation with a gamma ray source of an energy level effective to induce X-ray fluorescence in uranium and determining the total of the natural radiation and the induced radiation resulting therefrom above a level of approximately 60 Kev, comparing said total with similar data derived from a known uranium-bearing ore body to ascertain if any substantial attentuation of the induced radiation has taken place or if measurable X-ray fluorescence is observed, and determining the approximate actual concentration of U_3O_8 present in said unknown formation based upon the observed attenuation of the induced radiation or, alternatively, the resultant X-ray fluorescence caused thereby.

4,349,737
DETERMINATION OF MOVABLE OIL SATURATIONS

Roger L. Smith, Tulsa, and Robert P. Murphy, Bixby, both of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 167,878
Int. Cl.[3] G01V *5/00*
U.S. Cl. 250—259 6 Claims

1. A method of logging a subsurface formation containing formation oil and water penetrated by a wellbore which comprises:

a. producing said oil and water from said formation into said wellbore at a sufficiently low rate that the pressure in the formation adjacent to the wellbore approaches the pressure in the formation remote from the wellbore,

b. running a pulsed neutron log,

c. injecting crude oil into said formation until the response of a pulsed neutron log is essentially unchanged with continued injection of said crude oil,

d. injecting chlorinated hydrocarbon into said formation until response of a pulsed neutron log is essentially unchanged with continued injection of said chlorinated hydrocarbon,

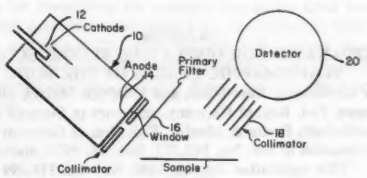
e. injecting an aqueous solution of known salinity and known neutron capture cross section into said formation until response of a pulsed neutron log is essentially unchanged with continued injection of said aqueous solution, and

f. injecting fresh water into said formation until response of a pulsed neutron log is essentially unchanged with continued injection of said fresh water, said fresh water having a known capture cross section which is sufficiently lower than the neutron capture cross section of said aqueous solution.

4,349,738
METHOD OF MEASURING THE CONTENT OF GIVEN ELEMENT IN A SAMPLE BY MEANS OF X-RAY RADIATION

Nils J. Baecklund, Sunnevik, S-572 00 Oskarshamn, Sweden

Filed Jul. 22, 1980, Ser. No. 171,147
Int. Cl.[3] G01N *23/20*; G21K *1/00*
U.S. Cl. 378—49 1 Claim



1. A method of determining the content of a given element in a sample by means of X-ray radiation, by determining the intensity of the X-ray fluorescence radiation of said element, comprising the steps of irradiating the sample with primary radiation containing wavelengths which are shorter than the absorption edges or discontinuities of those elements in the sample which may have a disturbing influence but longer than the absorption edge of the element to be determined, thereby to excite from the sample a first composite fluorescence radiation; measuring said first composite radiation; thereafter irradiating said sample with primary radiation which includes at least wavelengths which are shorter than said absorption edge or discontinuity of the element whose quantity is to be measured, thereby to excite from said sample a second composite fluorescence radiation; the primary radiation of said longer wavelength being of a wavelength λ, and the primary radiation of said shorter wavelength being a combined radiation of wavelength λ and $\lambda - d$, in which d is the difference in wavelength between said shorter and said longer wavelengths, measuring the intensity of said second composite radiation; subtracting the intensity of the first composite radiation from the intensity of the second composite radiation, and calculating the difference in intensity therebetween.

4,349,739
MICRO-CALCIFICATION DETECTION

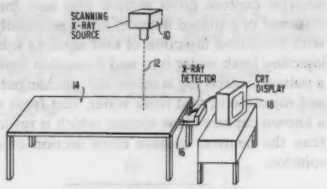
Martin Annis, Cambridge, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jul. 28, 1980, Ser. No. 172,885
Int. Cl.[3] A61B *6/00*; H04N *7/18*
U.S. Cl. 378—99 14 Claims

1. A micro-calcification detection method for use with an X-ray scanning system of the type comprising an X-ray beam

source or X-ray fan source, detector means for detecting changes in the intensity of said X-ray beam or X-ray fan during the X-ray scanning of a subject, and a visual display created by the resolution of detected changes in X-ray intensity into picture elements on said visual display,

the method being operative to indicate the presence of ob-



jects in the subject too small for satisfactory resolution into picture elements on said visual display and comprising the steps of:

analyzing said detected changes for X-ray intensity changes attributable to said objects, and

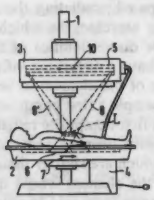
generating a bright dot on said visual display when such a change is found.

4,349,740

APPARATUS FOR DISPLAYING FLUOROSCOPIC TOMOGRAPHIC IMAGES OF THE BODY

Peter Grassmann; Kurt Dietz, and Friedrich Meinel, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 861,277, Dec. 16, 1977, abandoned.
This application Jan. 11, 1980, Ser. No. 111,399
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658533
Int. Cl.³ A61B *6/00*
U.S. Cl. 378—25 **13 Claims**



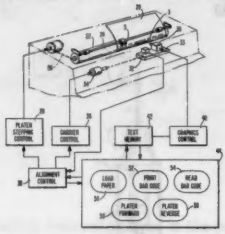
1. An apparatus for obtaining body layer images with x-ray or similarly penetrating rays, said apparatus comprising radiation source means and a recording unit operable to produce a scanning operation in which a beam coming from the source means penetrates the subject to be examined and the beam emerging from the body is caused to act on the recording unit, the source means comprising a row of x-ray tubes lying in a common plane and each being switched on for a time period required to operate the recording unit, the x-ray tubes being separated from one another and being disposed for scanning a longitudinal body layer parallel to said common plane by sequential activation thereof, the cathode of each tube having a switching grid for controlling emission therefrom, and means for sequentially actuating said grids in synchronism with a shifting of the recording unit to effect emission of an x-ray beam from the x-ray tubes in said row in such a sequence that the longitudinal body layer parallel to the plane of said sources is scanned while all other layers are blurred.

4,349,741

EAR CODE WITH ALIGNMENT MARK

Kevin L. Bobart, Lexington, Ky., and Gregory A. Flurry, Pleasantville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,311
Int. Cl.³ G06K *7/10*
U.S. Cl. 250—568 **11 Claims**



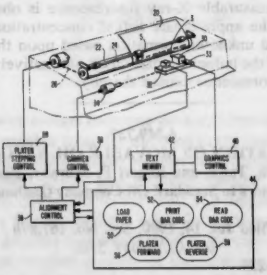
1. The method of recording information using a printer capable of printing both bar code information having separated bars and a closed alignment symbol extending in length at least the width of several of said bars comprising the steps of printing said closed symbol with said printer, spacing said printer relative to said closed symbol printed, and printing bar code information with said printer wherein the improvement comprises scanning for the closed symbol printed after it is printed with a scanner which is mounted for movement with the printer to determine the location of an edge of said symbol, then determining a correction factor defining the difference between the location of printing by said printer and the location of scanning by said scanner, then printing bar code information with said printer, then positioning the scanner generally near the center of said printed bar code by use of said correction factor and reading said bar code with said scanner.

4,349,742

BAR CODE WITH ALIGNMENT MARK

Gregory A. Flurry, Pleasantville, N.Y.; Michael L. Krieg, and David W. Phillips, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,337
Int. Cl.³ G06K *7/10*
U.S. Cl. 250—568 **3 Claims**



1. A method of recording and subsequently sensing information using a printer capable of printing both bar code information having separate bars and a closed alignment symbol extending in length at least the width of several of said bars comprising the steps of

(1) printing said closed symbol with said printer,

(2) spacing said printer relative to said closed symbol printed,
(3) printing bar code information with said printer,
(4) subsequently scanning the area of said printing with a mechanical sensor until said closed symbol is sensed, and then
(5) spacing a mechanical sensor a predetermined distance from the position at which said closed symbol is sensed to align the sensor for sensing said bar code printed.

4,349,743

SOLID-STATE IMAGING DEVICE

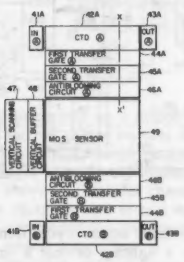
Shinya Ohba; Shoji Hanamura, both of Kokubunji; Toshifumi Ozaki, Tokyo; Masaharu Kubo, Hachioji; Masaaki Nakai, Kodaira; Kenji Takahashi, Kodaira; Masakazu Aoki, Kodaira; Iwao Takemoto, Tokyo; Haruhisa Ando, Hachioji, and Ryuichi Izawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,865

Claims priority, application Japan, Nov. 14, 1979, 54-157030[U]

Int. Cl.³ H01L *27/14*

U.S. Cl. 250—578 **10 Claims**



1. In a solid-state imaging device wherein a photosensor part is constructed of a MOS-type sensor in which picture elements each consisting of a photodiode and a switching insulated-gate field effect transistor are arrayed in the form of a matrix, signal outputs of the respective picture elements of said MOS-sensor are transferred to a CTD (Charge Transfer Device) through signal output lines, and the signal outputs are read out by said CTD; a solid-state imaging device characterized by comprising means for supplying bias charges to said CTD, and signal-transfer means for causing the bias charges to get into said signal output lines so as to mix them with signal charges and for causing the mixed signal charges to get back into said CTD.

4,349,744

SYSTEM FOR OPERATING MULTIPLE GAS TURBINES FOR COORDINATED DEAD LOAD PICKUP

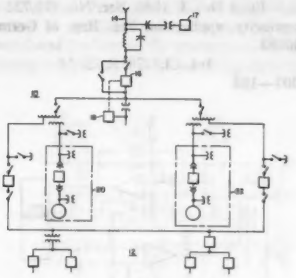
John F. Reuther, Penn Hills Township, Allegheny County; Stephen J. Jennings, Radnor Township, Delaware County, and Robert A. Yannone, Aldan, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 703,737, Jul. 9, 1976. This application Apr. 21, 1980, Ser. No. 142,520

Int. Cl.³ H02J *3/08*; H02P *9/04*

U.S. Cl. 290—40 C **12 Claims**

1. A system for supplying power to a dead load bus comprising a first gas turbine-generator unit and at least a second gas turbine generator unit, a first generator breaker connected between said first unit and a plant auxiliary bus and a second generator breaker connected between said second unit and the auxiliary bus, first fuel control means for controlling the speed of said first unit and second fuel control means for controlling the speed of said second unit, first and second means for closing said first and second generator breakers, means for generating a dead load mode select signal, means for operating said first and second fuel control means and said first and second breaker control means in response to a dead load mode select signal to accelerate said units simultaneously to a higher than normal speed condition and to close one of the breakers to the auxiliary bus and then sequentially operate the other unit to synchronize the other breaker to the auxiliary bus, said operating means including logic means for selecting one of said units as the lead unit and for shifting the lead between said units



under predetermined conditions, and the first generator breaker closed being the breaker associated with the lead unit, means for connecting the auxiliary bus to the dead load bus after the generator units have been synchronized with each other, and means for operating said fuel control means to control the frequency of power generation and to provide for load sharing between said units during and after the dead load transient.

4,349,745

TESTING CIRCUIT FOR FUEL BURNER CONTROLS

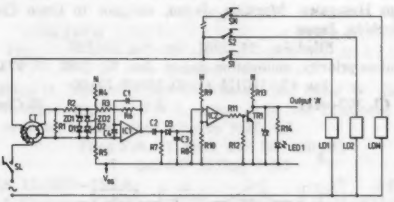
Keith J. G. Adams, Solihull; Alan Brightwell, Stourbridge; Barry L. Price, Solihull; Stuart M. Pegler, Solihull, and Paul Weall, Solihull, all of England, assignors to British Gas Corporation, London, England

Filed Mar. 3, 1981, Ser. No. 240,006

Claims priority, application United Kingdom, Nov. 6, 1980, 8035732

Int. Cl.³ H02J *1/08*

U.S. Cl. 307—12 **8 Claims**



1. A control system comprising a plurality of switching devices connected in parallel with one another across a power supply, each switching device being arranged to connect or disconnect said power supply to one of a corresponding plurality of load devices, a further switching device connected between said plurality of switching devices and said power supply to isolate said switching devices and their respective load from said power supply and testing means connected between said further switching device and said plurality of switching devices wherein said testing means includes discriminating means for sensing whether the circuit between said plurality of loads and said power supply is complete or open and indicating

means for indicating whether the circuit between said plurality of loads and said power supply is complete or open.

4,349,746

FREQUENCY GENERATOR

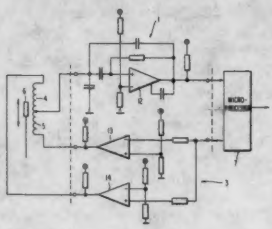
Horst Grossner, Bergien; Günter Weiger, Esslingen, and Günter Schwegler, Weinstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1980, Ser. No. 192,722

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940083

Int. Cl.³ G01R *23/14*

U.S. Cl. 307—106 **12 Claims**



1. A frequency generator comprising a first generator circuit and a second generator circuit, the frequencies of these circuits being variable by a parameter, with two coils arranged coaxially on one of linear and curved tubular coil holders, the inductances of these coils being variable by a core displaceable in the coil holder, a combined generator module connected by a control circuit and a changeover switch alternatingly with one of the two coils between which coils a short-circuit ring is arranged in an axially normal plane, for the duration of a specific number of pulses of the generator circuit formed from the coil and the generator module; and control regulating means for calculating from certain pulses of successive pulse sequences of the two generator circuits the frequencies (f1; f2) and their difference (f1 − f2) and a corrected value thereof to indicate the corrected frequency difference and for transmitting a signal proportional thereto.

4,349,747

SOUND RESPONSE TIME SWITCH FOR FLOWING CURRENT FOR A PREDETERMINED PERIOD OF TIME

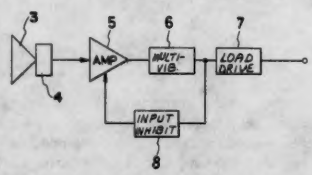
Bungo Hasegawa, Machida, Japan, assignor to Ozen Corp., Machida, Japan

Filed Jan. 21, 1981, Ser. No. 226,937

Claims priority, application Japan, Jan. 30, 1980, 55/9736

Int. Cl.³ H01H *35/00*; H04R *17/00*

U.S. Cl. 307—117 **10 Claims**



1. A sound actuated switching apparatus to allow an electrical current to flow for a predetermined period of time comprising:

a vibratory element adapted to be vibrated by sound;

means connected to said vibratory element for converting vibrations of said vibratory element into electrical signals;

means, electrically connected to said converting means, for amplifying said electrical signals from said converting means;

load driving means for operating an electrical load;

means, connected to said amplifying means, for allowing an electrical current to flow to said load driving means for a predetermined period of time after the initiation of said electrical signals from the converting means; and

input inhibit means, responsive to said current flow allowing means, for inhibiting an output from said amplifying means for a predetermined period of time after the flow of electrical current to said load driving means has terminated.

4,349,748

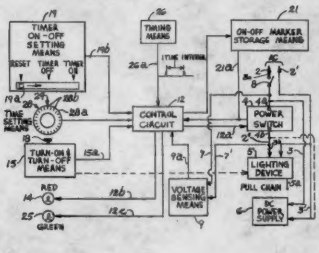
TIMER AND POWER CONTROL SYSTEM

Richard Goldstein, Northbrook, and Louis W. Schornack, Niles, both of Ill., assignors to Dynascan Corporation, Chicago, Ill.

Filed Mar. 21, 1979, Ser. No. 22,453

Int. Cl.³ H01H *43/04*

U.S. Cl. 307—132 E **38 Claims**



1. A twenty-four hour repeat cycle home lighting timer system comprising: a lighting device; a timer power input terminal; a load device-connecting terminal; power switch means coupled between said timer power input and load device-connecting terminals; means connecting said load device-connecting terminal to said lighting device; said power switch being operable to circuit closing and opening conditions which respectively effect coupling and de-coupling of said load device-connecting terminal to and from said lighting device; manually operable light turn-on and turn-off means operable successively to light turn-on and turn-off conditions which respectively normally operate said power switch means to said circuit closing and circuit opening conditions; manually responsive timer condition setting means settable to at least timer-off and timer-on and reset conditions; storage means having respective storage locations assigned to various successive time intervals over a twenty-four hour programming period and in which light turn-on and turn-off markers can be respectively placed or retained; synchronous timing and storage location accessing means for continuously synchronously accessing the storage locations containing the markers for the various time intervals involved; and control means responsive first to the setting of said setting means from said reset to either said turn-on or turn-off condition and then to the operation of said manually operable light turn-on and turn-off means only during the first twenty-four hour programming period for storing or retaining said turn-on and turn-off markers under control of said accessing means in appropriate storage locations of said storage means only during the first twenty-four hour programming period so that the timer system is programmed to effect automatic control of said lighting device in accordance with the actual normal pattern of operation of said manually operable turn-on and turn-off means only during such period, and means for operating said power switch means in accordance with the synchronously accessed markers in said storage locations of said storage means when said setting means is in said timer-on condition and for preventing control

of said power switch means by said marker when said setting means is in said timer-off condition.

4,349,749

INTEGRATED CIRCUIT FOR TRANSFERRING COMPLEMENTARY CHARGE PACKETS BETWEEN TWO CHARGE TRANSFER DEVICES

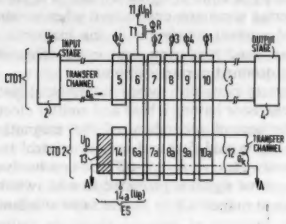
Hans-Joerg Pfleiderer, Zorneding, and Heiner Klar, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,650

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2936731

Int. Cl.³ G11C *19/28*; H01L *29/78*

U.S. Cl. 307—221 D **3 Claims**



1. In a circuit integrated on a doped semiconductor body having first and second charge transfer devices each having a transfer channel in which charge packets are transferred by clock pulse voltages respectively applied to successive electrodes disposed above said transfer channels, an improvement for generating a charge packet in said second charge transfer device which is complementary to a charge packet in said first charge transfer device comprising:

a switching transistor connected to a reference voltage source and having a control input connected to a pulsed reset voltage;

at least one resettable gate electrode disposed above each said transfer channel and separated from said semiconductor body by an electrically insulating layer, each said resettable gate being connected to said reference voltage source through said switching transistor with pairs of said resettable gates respectively disposed above each said transfer channel being electrically connected, and said resettable gate electrode disposed above the transfer channel of said second charge transfer device forming a final electrode in an input stage for said second charge transfer device, said input stage generating a plurality of charge packets of constant size,

whereby the appearance of a charge packet beneath said resettable gate electrode in said first charge transfer device decreases the potential beneath the resettable gate electrode above said second charge transfer device such that a potential well is formed which is filled with charge carriers forming a complementary charge packet in said second charge transfer device.

4,349,750

SWITCHING CIRCUIT COMPRISING A PLURALITY OF INPUT CHANNELS AND AN OUTPUT CHANNEL

Martinus F. A. M. Geurts, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

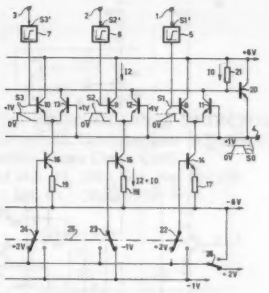
Filed Jan. 14, 1980, Ser. No. 111,579

Claims priority, application Netherlands, Feb. 16, 1979, 7901270

Int. Cl.³ H03K *17/30, 17/60*

U.S. Cl. 307—243 **2 Claims**

1. A switching circuit comprising a plurality of input channels and an output channel, an associated switching device having been provided between the output channel and each input channel, each switching device comprising an emitter-coupled pair of transistors having a switchable transistorized current source in the emitter lead, the emitter of said transistorized current source being connected to a supply voltage through a resistance and the collector thereof connected to the emitter of said switching device, the first and the second transistor, respectively, of each pair having its base connected to the associated input channel and to the output channel, respectively, the collectors of said second transistors of each pair being interconnected, the output channel comprising a transistor the emitter of which is connected to the output of the output channel and the base to the interconnected collectors of the said second transistors in the switching devices, the junc-



tion point of said output transistor and said collectors of said second transistor of each pair being connected via a resistor to a voltage-carrying terminal which is further connected to the interconnected collectors of said first transistors in the switching devices, the switching circuit furthermore comprising a selection switch by means of which at all times only one of said transistorized current sources can be switched to the current-carrying state, said bases of said transistors which are arranged as switchable transistorized current sources are connectable via the selection switch to a terminal, for carrying a d.c. voltage having a value at which the transistorized current source can be driven to the saturated state but can, however, not carry current because the signal voltages present at the base of said first and second transistors in the switching devices always cut-off these two transistors.

4,349,751

CONTROL CIRCUITRY USING A PULL-DOWN TRANSISTOR FOR HIGH VOLTAGE SOLID-STATE SWITCHES

Adrian R. Hartman, New Providence, and Peter W. Shackle, Bridgewater, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

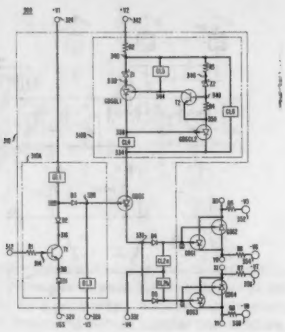
Filed Feb. 11, 1980, Ser. No. 120,282

Int. Cl.³ H03K *17/60*

U.S. Cl. 307—252 A **3 Claims**

1. Circuitry for use with a first switching device (GDS1) of the type comprising a semiconductor body (16) a bulk portion of which is of a relatively high resistivity, a first region (18) of a first conductivity type and of a relatively low resistivity, a second region (24) of a second conductivity type opposite that of the first conductivity type, the first (18) and second (24) regions being connected to output terminals of the switching device, a gate region (20) of the second conductivity type, the gate region (20) being coupled to a control terminal of the switching device (GDS1), the first (18), second (24) and gate (20) regions being mutually separated by portions of the bulk of semiconductor body (16), the parameters of the device (GDS1) being such that, with a first voltage applied to the control terminal of the first switching device (GDS1), a potential is

established within a cross-sectional portion of the bulk of the semiconductor body (16) which is substantially different from that of the potential of the first (18) and second (24) regions and which prevents current flow between the first (18) and second (24) regions, and that, with a second voltage applied to the control terminal of the first switching device (GDS1) and with appropriate voltages applied to the output terminals (X0, Y0) of the first switching device (GDS1), a relatively low resistance current path is established between the first (18) and second (24) regions by dual carrier injection, a second switching device (GDSC) of the same type as said first switching device, a second output terminal (330) of the second switching device (GDSC) being coupled to the control terminal of the first switching device (GDS1), a first branch circuit (310A)



coupled to the second switching device (GDSC) for controlling conduction between the first (18) and second (24) regions thereof, Characterized by

a second branch circuit (310B) coupled to the second switching device (GDSC) and being adapted to be coupled to a second potential source (+V2);

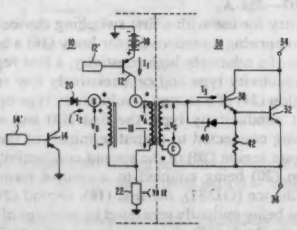
the second branch circuit (310B) being adapted to supply up to a preselected maximum current level to the second switching device (GDSC) to facilitate the switching of the first switching device (GDS1) from an ON state to an OFF state and then thereafter to reduce the current level to a lower level and then to repeatedly and automatically increase and decrease the current flowing therethrough until the first switching device is set to the OFF state.

4,349,752

MAGNETIC COUPLE DRIVE CIRCUIT FOR POWER SWITCHING DEVICE

Luciano Forte, Spring Valley, N.Y., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jul. 28, 1980, Ser. No. 172,669
Int. Cl.[3] H03K *17/60, 3/26*
U.S. Cl. 307—254 7 Claims



1. A magnetically coupled drive circuit for low power control of high current carrying switching devices, said drive circuit comprising:

a magnetic transformer having a primary winding and first and second secondary windings;

a first and second control transistor, said first control transistor being coupled between a source of voltage and an input to the primary winding of the magnetic transformer, said second control transistor being coupled between an input to the first secondary of the magnetic transformer and ground, each said transistor being independently responsive to individual control signals;

diode means interposed between the second control transistor and the input to the first secondary of the magnetic transformer;

current sensing means connected between commonly coupled terminals of the primary and first secondary of the magnetic transformer and ground, said sensing means providing a control signal to said first control transistor rendering same non-conductive when sensing a predetermined current maximum in the magnetic transformer's primary, and rendering same conductive when sensing a predetermined current minimum;

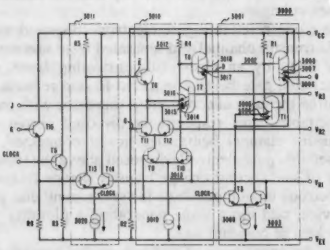
high current switching means including at least one switching transistor having a base and emitter electrode coupled to the second secondary of the magnetic transformer whereupon said first and second control transistors concurrently receive a turn-off non-conductive control signal, a drive signal is provided to said switching means of sufficient magnitude to render same substantially conductive.

4,349,753

EMITTER FUNCTION LOGIC FLIP-FLOP CIRCUIT

Robert J. Scavuzzo, Springfield Township, Bucks County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 29, 1980, Ser. No. 191,395
Int. Cl.[3] H03K *3/289, 19/086*
U.S. Cl. 307—272 A 7 Claims



1. A flip-flop circuit for performing the J-K logic function comprising:

a slave section including a D-latch having an output terminal for providing an output signal, a D input terminal, a clock input terminal for receiving a clock signal, and means coupling the clock signal to the clock input terminal, the D-latch being disabled when the clock signal is at a level representative of a first logic state.

a master section comprising: first and second voltage supply terminals; a latch circuit including a first transistor having first, second and third emitter electrodes, a base electrode and a collector electrode, and a second transistor having a first emitter electrode coupled in common with the first emitter electrode of the first transistor, a second emitter electrode coupled to the D input terminal of the D-latch of the slave section, a base electrode coupled to the collector electrode of the first transistor, and a collector electrode, first resistance means coupled between the collec-

tor electrode of the first transistor and the first voltage supply terminal, and means coupling the collector electrode of the second transistor to the first voltage supply terminal; a first current switch including a third transistor having emitter, base, and collector electrodes, and a fourth transistor having an emitter electrode coupled in common with the emitter electrode of the third transistor, a base electrode and a collector electrode; first current source means coupled between the commonly coupled emitter electrodes of the third and fourth transistors and the second voltage supply terminal; means coupling the collector electrode of the third transistor to the second and/or third emitter electrodes of the first transistor; means coupling the collector electrode of the fourth transistor to the commonly coupled emitter electrodes of the first and second transistors; means coupling a first reference voltage to the base electrode of first transistor; means coupling a clock signal to the base electrode of one of the third and fourth transistors and coupling a second reference voltage to the base electrode of the other of the third or fourth transistors for driving the third transistor to the OFF state and the fourth transistor to the ON state when the clock signal is at a level representative of a second logic state;

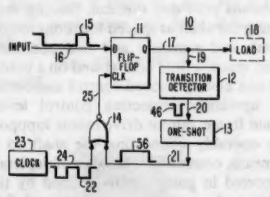
characterized in that the means coupling the collector electrode of the third transistor to the second and/or third emitter electrodes of the first transistor comprise a second current switch including a fifth transistor having emitter, base, and collector electrodes, and a sixth transistor having an emitter electrode coupled in common with the emitter electrode of the fifth transistor and coupled to the collector electrode of the third transistor, a base electrode, and a collector electrode, means coupling the collector electrode of the fifth transistor to the third emitter electrode of the first transistor; means coupling the collector electrode of the sixth transistor to the second emitter electrode of the first transistor and there are included means coupling the output signal from the D-latch of the slave section to the base electrode of one of the fifth and sixth transistors; means coupling a third reference voltage to the base electrode of the other of the fifth and sixth transistors; means coupling a J input signal to the second emitter electrode of the first transistor; and means coupling a K input signal to the third emitter electrode of the first transistor.

4,349,754

ACTUATION RATE LIMITER

Jeffrey F. Bull, Voorhees, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,631
Int. Cl.³ H03K *17/16, 17/26*
U.S. Cl. 307—443 **9 Claims**



1. An apparatus for limiting the rate at which transitions on an input signal are applied to the output thereof, said apparatus comprising:

means responsive to said input signal for providing upon the occurrence of clock signals said input signal to said output,

generating means coupled to said output of said first-mentioned means for generating a signal pulse of a first predetermined duration in response to particular changes of said input signal at said output,

coupling means for providing said clock signals having a period less than said first predetermined duration to said first-mentioned means, and

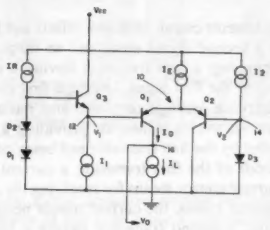
means coupled to said coupling means and responsive to said signal pulse for inhibiting the application of said clock signals to said first-mentioned means for the duration of said signal pulse and thereby inhibiting said input signal out of said first-mentioned means for said duration.

4,349,755

CURRENT PRODUCT LIMIT DETECTOR

Edward C. Bee, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 11, 1980, Ser. No. 120,509
Int. Cl.³ G06G *7/12, 7/16*
U.S. Cl. 307—492 **5 Claims**



1. A circuit for detecting when the product of two independent currents equals or exceeds a predetermined upper limit, comprising:

a load current source for providing a load current for defining said predetermined upper limit;

a differential amplifier including first and second transistors having their emitters connected in common to an emitter current source, wherein the collector of the first transistor is connected to the load current source for providing an output signal at said collector that changes state when the collector current is not less than said load current;

first means for providing a voltage signal at the base of the first transistor that is representative of the natural logarithm of the reciprocal of a first independent current; and

second means for providing a voltage signal at the base of the second transistor that is representative of the natural logarithm of a second independent current;

whereby said collector current of the first transistor is proportional to the natural logarithm of the product of said first and second independent currents;

wherein the first means comprises:

a third transistor connected as an emitter follower transistor with its emitter connected in common with the source of said first independent current and the base of the first transistor; a reference current source connected to the base of the third transistor; and

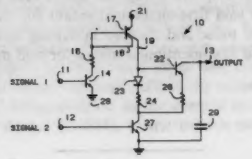
a first semiconductor junction device connected to the base of the third transistor for biasing the third transistor to provide a voltage at the base of the first transistor that is representative of the logarithm of the reciprocal of said first independent current.

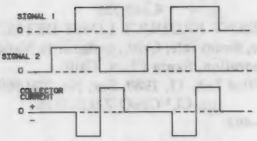
4,349,756

PHASE DETECTOR WITH LOW OFFSETS

Anthony D. Newton, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 17, 1981, Ser. No. 235,346
Int. Cl.³ H03K *5/26*; G01R *25/00*
U.S. Cl. 307—514 **10 Claims**





1. A phase detector circuit with low offsets and having a first signal input, a second signal input and an output, the phase detector comprising: a first transistor having a control electrode coupled to the first input, having a first electrode coupled to a reference voltage terminal, and having a second electrode; current source means for providing a current and being controlled by the first transistor and being coupled to the second electrode of the first transistor; a current mirror coupled to the current source means for receiving the current from the current source means, the current mirror being coupled to the output; and a second transistor having a base electrode coupled to the second input, having an emitter electrode coupled to the reference voltage terminal, and having a collector electrode coupled to the current mirror whereby an in-phase condition at said phase detector inputs causes the current from said current source to be mirrored by said current mirror.

4,349,757

LINEAR OSCILLATING ELECTRIC MACHINE WITH PERMANENT MAGNET EXCITATION

Suresh K. Bhate, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 8, 1980, Ser. No. 148,040
Int. Cl.³ H02K *33/00*
U.S. Cl. 310—15 **11 Claims**

1. A permanent magnet linear power convertor, comprising:

a body formed of magnetically permeable material and having a longitudinal axis;

a stator having a longitudinal axis and mounted concentrically with respect to said body, said stator having a plurality of annular spaces formed therein;

a plurality of coils, one disposed in each of said annular spaces and having leads for connection to an AC source or an electrical load;

means for mounting said stator and said body for relative axial reciprocating movement;

said stator having a surface facing said body;

each of said annular spaces opening in said surface in a narrow circumferential slot of a predetermined axial width;

said body having a surface facing said stator surface; a plurality of permanent magnets mounted on said body surface, said magnets having alternately oriented radial polarities, said magnets being spaced apart on centers equal to the corresponding spacing between said coils and with an axial gap about equal to the axial width of said circumferential slots;

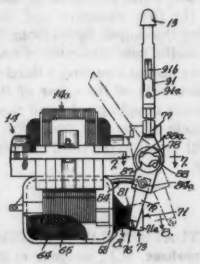
whereby relative axial reciprocation of said body and said stator will cause a reversal of the flux linking said coils, while the flux in said body remains substantially constant.

4,349,758

MODULAR HAND MIXER

Edward J. Grant, Jr., Chicago; William H. Scott, Lombard, and John M. Stipanuk, Glen Ellyn, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 11, 1980, Ser. No. 111,412
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 A **9 Claims**



1. In combination, a modular universal motor and drive unit comprising a one-piece frame having spaced rails defining a space therebetween, a shaft having a motor armature and commutator means provided thereon, bearing means on said frame supporting the shaft at spaced locations longitudinally of said frame with said armature and said commutator means disposed in said space, a field coil wound on a bobbin mounted on said frame and having a speed control associated therewith including an upwardly projecting control lever pivotally mounted on said frame, output drive means suppported by said frame, means operably connecting the shaft to power said output drive means, commutator brushes of depletable material movably supported in guide means defined by the frame to cooperate with said commutator means, and four laterally disposed modular-unit support means provided on said frame at four spaced corners thereof; and a housing enclosing and supporting said modular unit with said output drive means exposed and said control lever projecting therefrom, said housing being formed by two vertically disposed housing halves having peripheral edges that abut along a parting line, four complementary support means formed on said housing halves, two on each housing half and cooperating with said four modular-unit support means to provide sole support of

said modular unit therewithin, and means holding said housing halves together with said peripheral edges abutted.

4,349,759

COMMUTATOR FOR ELECTRICAL MACHINES

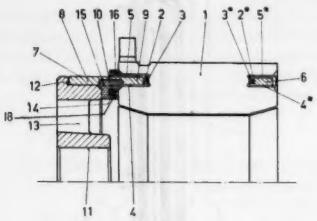
Niklaus Arnold; Josef Schmidli, both of Baden, and Peter Spiess, Zug, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Dec. 9, 1977, Ser. No. 859,214

Claims priority, application Switzerland, Dec. 10, 1976, 15550/76

Int. Cl.³ H02K *13/04*

U.S. Cl. 310—233 10 Claims



1. A commutator for electrical machines comprising:
a lamination assembly having a first surface;
a commutator hub having a second surface;
a shrink ring having first and second portions joined together by a decoupling portion,
the first ring portion having an inner surface with a diameter corresponding to the diameter of the first surface of the lamination assembly whereby the diameter of the first ring portion may be increased by heating and subsequently decreased by cooling,
the second ring portion having an inner surface with a diameter corresponding to the diameter of the second surface of the commutator hub whereby the diameter of the second ring portion may be increased by heating and subsequently decreased by cooling, and
the first and the second ring portions being simultaneously shrunk onto the first surface of the lamination assembly to hold together the lamination assembly and onto the second surface of the commutator hub to be joined to the commutator hub respectively.

4,349,760

CURRENT TRANSFER BRUSH WITH GRAPHITE FOILS

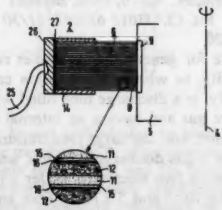
Heinrich Diepers, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,315

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2944065

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—248 7 Claims



1. A current transfer brush having a sliding element containing a plurality of highly graphitized graphite foils, the graphite foils each having foil surfaces and being disposed in a stacked arrangement wherein the foil surfaces of each graphite foil are substantially parallel to the foil surfaces of an adjacent graphite foil, the current transfer brush having a contact surface substantially perpendicular to the foil surfaces of the graphite foils, at least one such graphite foil being at least partially coated with an electrically conductive material, the current transfer brush being characterized in that there is further provided at least one sheet of highly graphitized graphite fibers interposed between adjacent ones of the graphite foils, said graphite fibers being coated with an electrically conductive material.

4,349,761

FLAT TYPE CORELESS ROTARY ELECTRIC MACHINE

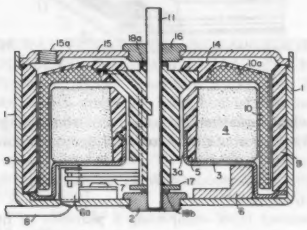
Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 18, 1980, Ser. No. 131,498

Claims priority, application Japan, Mar. 20, 1979, 54-32630

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—266 4 Claims



1. A coreless motor structure suitable for contributing to improve a motor of flat type using a cup-shaped rotary coil having one open end and another closed end in accordance with an arrangement of a commutator, a brush and said rotary coil, and an electric connection between said commutator and coil, comprising:
(a) a coreless rotary coil including
a first inclined coil part formed by winding a wire conductor for a rotary coil of said coreless motor in such manner that, to form a coil body in a shape of cup with one open end and another closed end constituted of an end connection part being a portion of said rotary coil, a winding extends obliquely from one point on one edge of a cylindrical circumferential surface of said coil body to another edge thereof at a predetermined inclination relative to a generatrix of said coil body,
a second inclined coil part formed by winding said wire conductor in such manner that said winding is turned back at a position in the vicinity of said open end and extends obliquely toward an edge nearly opposed to said one edge of said cylindrical circumferential surface of said coil body, and
an end connection part for making a connection of said inclined coil parts across the area of the end surface of said cup-shaped body, and formed by winding said inclined coil parts and an end connection part a plural number of times at the same position in layer with the same number of turns so as to form said cup-shaped rotary coil, said end connection part being connected to a rotary shaft;
(b) magnet means constituting a stator of said coreless motor, said magnet means disposed within said rotary coil on the side of the closed end thereof in such manner that the length of said rotary coil in the axial direction of said rotary shaft is long enough relative to that of said magnet means to define an open space between said magnet means and the open end of said rotary coil;

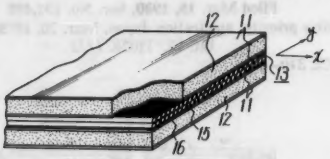
(c) said commutator being fixed integrally with said rotary shaft and disposed within said rotary coil; and
(d) said commutator and said brush being disposed within said open space in such manner that said brush extends in parallel with said commutator in the direction normal to said rotary shaft.

4,349,762

FIBER REINFORCED PIEZOELECTRIC BENDER TRANSDUCER

Tomosaburo Kitamura; Kosuke Miyahara, and Yoichi Kodera, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,339
Claims priority, application Japan, May 2, 1979, 54-54266
Int. Cl.³ H01L 41/08
U.S. Cl. 310—332 7 Claims



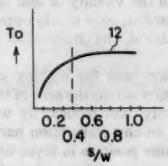
1. An electro-mechanical transducer comprising:
(a) a first layer made of piezoelectric material having opposing major surfaces;
(b) a pair of electrodes formed on said major surfaces, respectively; and
(c) a second layer comprising a plurality of fibers whose surface is clamped to one of said surfaces of said first layer; said first layer having a Young's modulus of E, said second layer having a Young's modulus Ex in one direction x, and a Young's modulus Ey in a direction y perpendicular to said one direction in said major surface, said Young's moduli E, Ex, Ey satisfying the relation $E > Ey$, $Ex > Ey$, and one end of said layers being clamped along one edge so that its opposite edge is free to move and said x and y directions lying in the plane of said second layer.

4,349,763

TUNING FORK TYPE QUARTZ RESONATOR

Hideo Hoshi; Shiro Mitsugi; Hiroichi Teruyama, and Hideo Tabata, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 19, 1979, Ser. No. 50,128
Claims priority, application Japan, Jun. 27, 1978, 53-77614
Int. Cl.³ H01L 41/08
U.S. Cl. 310—370 7 Claims



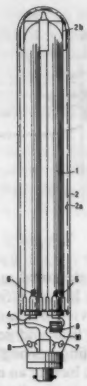
1. A tuning fork type quartz crystal resonator formed by etching and having vibratable arms, a whole length $L \leqq 5$ mm, a whole width $W \leqq 1$ mm and a thickness $t > 50\mu$ and being vibratable in the flexural mode by driving electrodes arranged at both major surfaces and side surfaces thereof; the improvement wherein the vibratable arms are dimensioned to satisfy the relationships $s/t \leqq 1$ and $s/w \geqq 0.4$ where w is the width of the vibrating arms and s is the space between the vibrating arms.

4,349,764

LOW-PRESSURE METAL VAPOR DISCHARGE LAMP

Peter K. R. M. Steeman, and Karel R. Vervecken, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,969
Claims priority, application Netherlands, Sep. 28, 1979, 7907220
Int. Cl.³ H01J 19/70, 61/24
U.S. Cl. 313—176 2 Claims



1. A low-pressure metal vapor discharge lamp having a discharge tube arranged in an evacuated outer bulb, current conductors extending in a vacuum-tight manner through the wall of the outer bulb and the wall of the discharge tube into the discharge tube where they are each connected to a respective electrode, a barium-containing getter and an electric getter auxiliary means in the form of an electric resistor being present in the evacuated space between the discharge tube and the outer bulb, the resistor receiving in the operating condition of the lamp an electric current by way of the current conductors, the resistor having an operating temperature in the range from 500°–2000° C., characterized in that the resistor is enveloped for the greater part by a hollow insulating element.

4,349,765

ULTRAVIOLET GENERATING DEVICE COMPRISING DISCHARGE TUBE JOINED TO TWO TUBULAR ENVELOPES

Gerold Brändli, Aarau, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

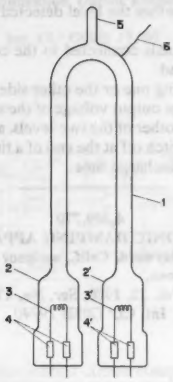
Filed Oct. 30, 1978, Ser. No. 955,711
Claims priority, application Switzerland, Oct. 31, 1977, 13198; Fed. Rep. of Germany, Apr. 5, 1978, 2814683
Int. Cl.³ H01J 61/067, 61/30
U.S. Cl. 313—220 7 Claims

1. In a device for generating ultraviolet radiation of high radiation intensity, in which the radiation can be generated thermoemissively, in a discharge tube filled with mercury and at least one rare gas and having an internal diameter of between 4 and 20 mm, said discharge tube transmitting UV radiation by means of a gas discharge which is wall-stabilized and takes place between two electrodes under a pressure of mercury between 5×10^{-3} and 5×10^{-1} Torr and a pressure of rare gas between 0.01 and 10 Torr and at a current density of the discharge current of the gas discharge between 1 and 25 A/cm^2, the two ends of the discharge tube being joined to two

tubular envelopes for receiving the electrodes, the improvement comprising:

said at least one rare gas comprising a gas from the group consisting of argon, krypton and xenon under a gas pressure (p) which, in the operating state of the device, is between 0.01 and 0.5 Torr;

the discharge tube and the envelopes comprising doped quartz glass, the doping of which is such that radiation lines at 185 and 195 nm are almost completely absorbed and a radiation line at 254 nm is transmitted almost without loss; and,



an appendix-like piece of tube, which is to receive condensed mercury and the temperature of which is adjustable between 48° and 65° C., provided on the discharge tube

wherein the internal diameter of the discharge tube is between 8 and 15 mm; the diameter of the appendix-like piece of tube is 0.3–1 times the diameter of the discharge tube; the diameters of the envelopes are 1–4 times the diameter of the discharge tube; the length of the discharge tube is between 0.8 and 2 m; the length of the appendix-like piece of tube is 0.005–0.1 times the length of the discharge tube; and the volume of the envelopes is 0.5–4 times the volume of the discharge tube.

4,349,766

DIRECTLY HEATED CATHODE FOR ELECTRON TUBE

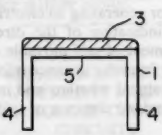
Hisashi Ando; Ko Soeno; Hiroshi Sakamoto, all of Hitachi; Akira Misumi, Mobara, and Hiroshi Fukushima, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1980, Ser. No. 143,898

Claims priority, application Japan, Apr. 28, 1979, 54/52770

Int. Cl.³ H01J *1/14, 19/06;* H01K *1/04*

U.S. Cl. 313—346 R **12 Claims**



1. A directly heated cathode for an electron tube, which comprises a base metal of Ni-W alloy consisting essentially of 20–30% by weight of tungsten, and the balance being nickel and incidental impurities, said alloy being free from a reducing agent, and a layer consisting essentially of thermoelectron emission oxides laid directly and baked onto a flat part at a front side of the base metal, the layer of thermoelectron emission oxides being in direct contact with the flat part of the base metal and Ba_3WO_6 being predominant at a boundary surface between the metal base and the layer of thermoelectron emission oxides.

2. A directly heated cathode for an electron tube, which comprises a base metal of Ni-W alloy consisting essentially of 20–30% by weight of tungsten, and the balance being nickel and incidental impurities, said alloy being free from a reducing agent, a flat part of the base metal being coated with platinum, and a layer consisting essentially of thermoelectron emission oxides laid directly and baked onto the platinum coated flat part of the base metal, the layer of thermoelectron emission oxides being in direct contact with the flat part of the base metal and Ba_3WO_6 being predominant at a boundary surface between the metal base and the layer of thermoelectron emission oxides.

4,349,767

CATHODE RAY TUBE RESISTANCE OF RUTHENIUM OXIDE AND GLASS CONTAINING ALUMINA POWDER

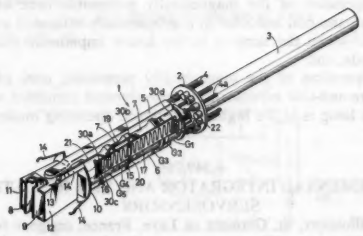
Shoichi Muramoto, Tokyo; Yoshihiro Tsukamura, Kawasaki; Masayuki Tozawa, and Fusao Ishii, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 868,694, Jan. 11, 1978. This application Jul. 16, 1979, Ser. No. 58,104

Claims priority, application Japan, Jan. 17, 1977, 52-4577; Jul. 15, 1978, 53-86507

Int. Cl.³ H01J *29/96, 29/82*

U.S. Cl. 313—449 **12 Claims**

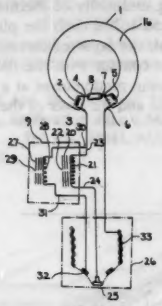


1. An electron gun which is used for television picture tube having an evacuated bulb including a funnel portion, a neck portion and screen portion including a plurality of electrodes for focusing and accelerating an electron beam generated by a cathode, aligned along the axis of said neck portion, comprising a resistor formed of an insulating substrate on which a resistive path is formed, said substrate being mounted along said plurality of electrodes and sealed in said neck portion, said resistive path having one end tap, another end tap and at least one intermediate tap between said end taps, said one end tap being supplied with the same voltage as the voltage supplied to said screen portion, said another end tap being connected to a terminal pin provided at one end tap of said neck portion for connection to a voltage low enough to avoid an electric discharge between electrodes and said terminal pin, an operating voltage for the electrodes being obtained from said intermediate tap by dividing the voltage between both of said end taps, said resistive path comprising a mixture of ruthenium oxide and glass, and said substrate and said resistive path being overcoated with at least one layer of glass, said layer of glass contained alumina powder.

4,349,768
METHOD FOR STARTING AND OPERATING A PREHEAT TYPE FLUORESCENT LAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Creators, Inc., Chicago, Ill.

Filed Jun. 26, 1980, Ser. No. 163,067
Int. Cl.[3] H05B *41/18, 41/40*
U.S. Cl. 315—105 7 Claims



1. A method for starting and operating a preheat type fluorescent lamp in which the lamp has a first lower impedance starting mode providing current flow through at least one lamp filament operated in series with a starting switch means from an electrical power source, a second higher impedance operating mode providing current flow through the lamp with said starting switch open, and a series saturable magnetically permeable core-and coil inductor for limiting current flow through the lamp in which the improvement comprises:

passing current from the starting switch means through said coil-core inductor at a level to provide

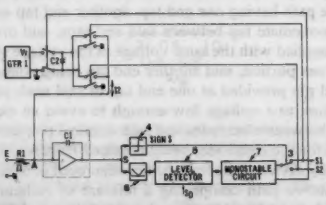
(a) operation of the magnetically permeable core of the core-and-coil inductor in a substantially saturated condition when the lamp is in the lower impedance starting mode; and

(b) operation of the magnetically permeable core of the core-and-coil inductor in a non-saturated condition when the lamp is in the higher impedance operating mode.

4,349,769
INCREMENTAL INTEGRATOR AND THE RESULTING SERVOSENSORS

Guy Willoteaux, St. Germain en Laye, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Villacoublay, France

PCT No. PCT/FR79/00053, § 371 Date Feb. 26, 1980, § 102(e) Date Feb. 20, 1980, PCT Pub. No. WO80/00206, PCT Pub. Date Feb. 7, 1980
PCT Filed Jun. 21, 1979, Ser. No. 193,269
Claims priority, application France, Jun. 26, 1978, 78 18959; Jul. 20, 1978, 78 21466
Int. Cl.[3] G05F *1/00*
U.S. Cl. 318—677 10 Claims



1. Incremental output integrator comprising:

an analog summing integrator amplifier comprising an input intended to be connected to a generator delivering a current I_1 representing a magnitude to be measured:

a capacitance connected to the second input of the summing amplifier by a controllable inverter having two control terminals;

a voltage generator connected to the terminals of said capacitance by a double load switch;

a control circuit of said inverter comprising at least a high and low level detector of the output voltage of the summing integrator and means to transmit a control signal to one or other of the control terminals of the inverter depending on whether the level detected is a high level or a low level;

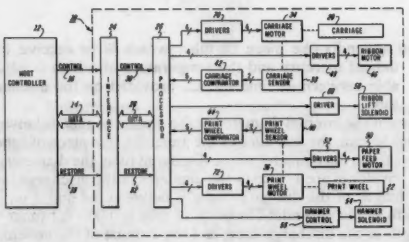
two output terminals connected to the control terminals of the inverter, and

a circuit controlling one or the other side of the double load switch when the output voltage of the summing integrator reaches one or other of the two levels, and then to turn the double load switch off at the end of a time equal at least to the capacitor discharge time.

4,349,770
ELECTRONIC DAMPING APPARATUS

Robert A. Ragen, Hayward, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 22, 1980, Ser. No. 171,205
Int. Cl.[3] G05B *19/40*
U.S. Cl. 318—685 13 Claims



1. Apparatus for controlling the movement of a movable element to bring said movable element to rest at a desired stopping position, said apparatus comprising:

a multi-phase drive motor having a drive shaft coupled to said movable element for driving same, four electrically conductive coils mounted in position-displaced relationship about said shaft, and means coupled to said drive shaft and responsive to the selective energization of said coils by respective motor drive signals for causing the corresponding rotation of said drive shaft and movement of said movable element;

a sensor coupled to said drive shaft and responsive to the rotation thereof for generating an electrical signal containing information indicative of the direction, speed and distance of movement of said movable element;

means for detecting from the distance information indicated by said electrical signal whether said movable element is within a predetermined distance of said desired stopping position; and

control means for controlling the levels of said motor drive signals in dependence upon the direction information indicated by said electrical signal following detection of said movable element being within said predetermined distance of said desired stopping position, said motor and thus said movable element being brought to a final stop with only a single one of said motor drive signals and thus corresponding single motor coil on, said control means including means for selectively turning on and off or reversing either the two coils displaced counterclockwise

of said single motor coil about said shaft or the two coils displaced clockwise of said single motor coil about said shaft in dependence upon the direction information indicated by said electrical signal.

4,349,771

STEPPER MOTOR CONTROL CIRCUIT

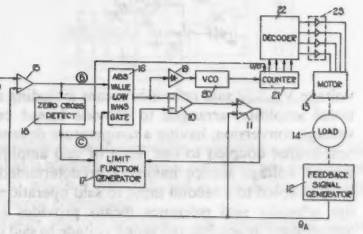
Keith Buxton, Mansfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 17, 1980, Ser. No. 188,212

Claims priority, application United Kingdom, Sep. 26, 1979, 7933441

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—685 **1 Claim**



1. A stepper motor control circuit comprising an electrical integrator generating an output signal dependent on the time integral of its input signal, a first error signal generating means connected to said integrator output and to the output of a transducer means sensitive to the value of a parameter variable by movement of the stepper motor shaft and producing a first error signal dependent on the difference between the integrator and transducer means outputs, a second error signal generating means for comparing the actual value of said parameter (as represented by the transducer means output) with a desired value thereof and producing a second error signal dependent on the difference between the desired and actual values of said parameter, selector means connected to said first and second error signal generating means and to said integrator and selecting the one of said first and second error signals having the lesser absolute value for application to the integrator input, integrator reset means connected to the output of the first error signal generating means and to the input of the integrator and applying to the integrator an additional signal varying non-linearly with the output of the first error signal generating means whereby the rate of change of the output of the integrator is limited in accordance with the value of the first error signal, pulse generator means connected to the output of said selector means and producing an output of frequency determined by the output of said selector means and a stepper motor drive circuit connected to the pulse generator means and providing driving pulses to the stepper motor.

4,349,772

METHOD AND APPARATUS FOR CONTROLLING AN ALTERNATING CURRENT MOTOR LOAD USING PLURAL CONTROLLED-CURRENT INVERTER CIRCUITS

Herbert W. Weiss, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 23, 1980, Ser. No. 219,734

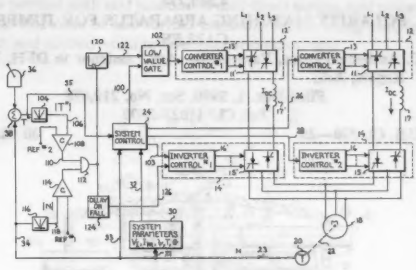
Int. Cl.³ H02P *5/40*

U.S. Cl. 318—799 **8 Claims**

1. A controlled-current motor drive of the type having a plurality inverter circuits connected in parallel for supplying, to a single electric motor load, electric power of controllable frequency and magnitude comprising:

(a) means for individually controlling said inverter circuits in response to respective input signals representing a desired level of motor operation;

(b) means for sensing when the motor power requirements are below a predetermined load and above a predetermined speed and to provide a mode shift signal in response to the simultaneous occurrence thereof; and,



(c) control means responsive to said mode shift signal for rendering less than the total number of said inverter circuits effective during the presence of said mode shift signal whereby the total of the motor power requirements are supplied by less than the total number of said inverter circuits.

4,349,773

CIRCUIT FOR PROTECTING STORAGE CELLS

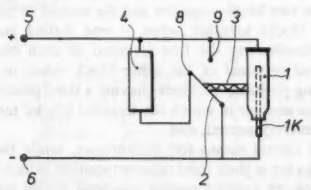
Bernd Hartmann, and Henner Meinhold, both of Sandhausen, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,460

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948700

Int. Cl.³ H01M *10/44*; H02J *7/00*

U.S. Cl. 320—5 **12 Claims**



1. Circuit for uniform charging and discharging of electrochemical storage cells of the alkali metal and chalcogen type, connected together to form a battery in which series-connected cells having positive and negative electrodes as individual cells or groups of several parallel-connected storage cells are series-connected to form a battery having a positive terminal and a negative terminal, with the cell having an anode chamber for containing alkali metal anolyte and a cathode chamber for containing chalcogen catholyte, with the anode chamber separated from the cathode chamber by an alkali ion-conducting solid electrolyte, a protective element shunted across each said series-connected cell which bridges the circuit through said series-connected cell upon said series-connected cell reaching a given maximum charge or discharge, a switch conductively connectible to the negative and positive electrodes of said series-connected cell and to the terminals of the battery, said protective element directly connected to said terminals of the battery, said series-connected cell having one of its electrodes connected to one of said terminals through said switch, the improvement comprising said protective ele-

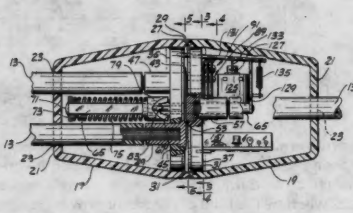
ment is a container whose outer surface forms an anode, and which container is filled with a chemical compound which easily dissociates and easily recombines, and an electrically conducting rod extending into and outside said container, and is electrically insulated in its mounting, forms a cathode.

4,349,774

POLARITY MATCHING APPARATUS FOR JUMPER CABLES

C. Anthony Farque, Fayetteville, Ark., assignor to DFH, Inc., Rogers, Ark.

Filed Dec. 1, 1980, Ser. No. 212,078
Int. Cl.³ H02J 7/00
U.S. Cl. 320—25 **30 Claims**



1. Polarity matching apparatus for use with jumper cables in connecting a supply of direct current to a battery to jump start an engine or the like, comprising:

two adjacent terminal blocks, each terminal block having at least two spaced primary contacts and first and second terminals connected to its primary contacts, in use of the apparatus the terminals of one block being connected to the battery terminals by a jumper cable and the terminals of the other block being connected to the supply terminals by the jumper cable;

the two terminal blocks being movable relative to one another between two alternative mating positions of the contacts, the contacts interconnecting the first terminals of the two blocks together and the second terminals of the two blocks together when in one mating position and interconnecting the first terminal of each block to the second terminal of the other block when in the other mating position, the blocks having a third position relative to one another in which the terminal blocks' terminals are not interconnected; and

control circuit means for determining, while the terminal blocks are in their third relative position, which of the two alternative contact mating positions would interconnect the positive terminals of the battery and supply together and the negative terminals of the battery and supply together and thereby match the polarity of the supply to the battery.

4,349,775

TEMPERATURE COMPENSATED VOLTAGE REGULATOR FOR PHOTOVOLTAIC CHARGING SYSTEMS

Yiduk Kwon, Bedford, and Paul Lawson, Hopedale, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 2, 1981, Ser. No. 222,053
Int. Cl.³ G05F 1/46; H02J 7/04
U.S. Cl. 320—35 **6 Claims**

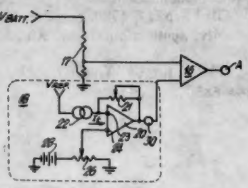
1. A regulator system for controlling photovoltaic charging of primary batteries, said system comprising:

storage batteries having a room temperature full charge voltage V_{normal}, said voltage being temperature dependent;

a photovoltaic array having an output voltage capable of exceeding V_{normal}, said array being coupled to provide charging power to said batteries;

regulator means interposed between said array and said batteries, said regulator means including comparator means for comparing battery voltage to a reference voltage;

reference voltage means capable of providing a reference voltage about equal to the temperature dependent charge



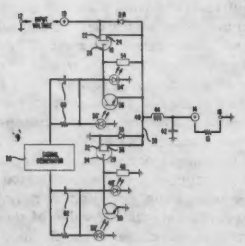
voltage V_{normal}, said reference means including an operational amplifier, arranged to provide biased current to voltage conversion, having a temperature dependent current source coupled to one input of said amplifier and a second voltage source having a predetermined voltage level coupled to a second input to said operational amplifier whereby said reference means provides a linearly temperature dependent reference voltage to said comparator means.

4,349,776

DC-TO-DC CONVERTERS UTILIZING FET DEVICES

Joseph Federico, Berkeley Heights, and Sigurd G. Waaben, Princeton, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 20, 1980, Ser. No. 198,286
Int. Cl.³ G05F 1/60
U.S. Cl. 323—222 **8 Claims**



1. A DC-to-DC converter comprising:

a series-connected combination of an inductor, a switching arrangement and an output element to be charged to a relatively small DC output voltage, said switching arrangement comprising a first FET device having a diode connected between the drain and source electrodes thereof, said diode being poled for forward conduction in the direction in which current is to flow to said element via said device,

means including a second FET device for connecting a relatively large DC input voltage to said inductor to establish a current flow therethrough,

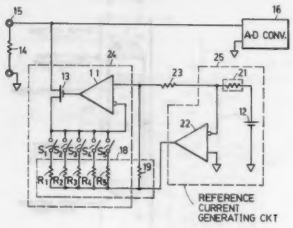
and means connected to said first and second FET devices for controlling said second device to be ON when said first device is OFF thereby to establish current flow through said inductor and for controlling said first device to be ON when said second device is OFF thereby to establish current flow from said inductor to said element via the drain-to-source path of said first device.

4,349,777

VARIABLE CURRENT SOURCE

Masakazu Mitamura, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Nov. 7, 1980, Ser. No. 204,929
Claims priority, application Japan, Nov. 19, 1979, 54-149655
Int. Cl.[3] G01R 27/14; G05F 1/58, 1/613
U.S. Cl. 323—226 6 Claims



1. A variable current source for providing a selected output current that is highly temperature stabilized to a current output terminal to which a selected load is connected, said variable current source comprising:

a reference current generator for generating a reference current of a constant value that is substantially insusceptible to the influence of temperature;

a plurality of reference resistance elements and a further resistance element for compensation use which are simultaneously formed on a common substrate so as to experience a common temperature;

an auxiliary reference voltage generator wherein the output of the reference current generator is connected with a first terminal of said further metal resistance element to generate an auxiliary reference voltage across said further resistance element;

a plurality of switches respectively connected in series with the plurality of reference resistance elements to form a respective plurality of series circuits;

and

a voltage-to-current converter which is connected to the series circuits and which, when one or more of said switches are turned ON, converts the auxiliary reference voltage to a current corresponding to the resistance value of the respective reference resistance element(s) connected to each of the switches turned ON,

wherein said selected output current that is output from said current output terminal of said variable current source has said highly trremperature stabilized output current for any combination of said switches being ON.

4,349,778

BAND-GAP VOLTAGE REFERENCE HAVING AN IMPROVED CURRENT MIRROR CIRCUIT

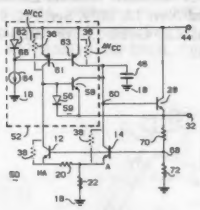
William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 11, 1981, Ser. No. 262,273
Int. Cl.[3] G05F 3/20
U.S. Cl. 323—314 12 Claims

1. A voltage reference circuit for providing a reference voltage having a substantially constant magnitude at an output terminal thereof, including in combination:

first and second voltage reference transistors of a particular conductivity type and each having emitter, base, and collector electrodes;

a negative feedback loop interconnecting said first and second voltage reference transistors and the output terminal of the voltage reference circuit, said negative feedback loop enabling the currents through said first and second transistors to have a predetermined non-unity ratio of current densities, said negative feedback loop further including a current mirror circuit having a diode means with first and second electrodes, said first electrode of said diode means being coupled to said first reference transistor, said diode means having a junction, and said current mirror circuit having further transistor means of said particular conductivity type with emitter, base, and collector electrodes, said further transistor means having a base-to-emitter junction coupled in parallel with said junction of said diode means, said collector electrode of said further transistor means being coupled to said second voltage reference transistor; and



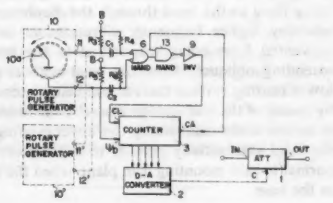
means coupled to said emitter electrodes of said first and second voltage reference transistors for developing a voltage having a positive temperature coefficient in response to said non-unity ratio of current densities, circuit meeans combining said voltage having said positive temperature coefficient with the emitter-to-base voltage of one of said first and second voltage reference transistors to produce a combined voltage in said negative feedback loop.

4,349,779

VOLUME CONTROL APPARATUS

Sadao Ono, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,645
Claims priority, application Japan, Jan. 25, 1980, 55-8275[U]
Int. Cl.[3] H03K 5/19; H03G 5/02
U.S. Cl. 323—318 5 Claims



1. A volume control apparatus which comprises:

an up/down counter having a clock input terminal, an up/down control terminal and a digital count output;

D/A converter means for converting said digital count output from said counter into an analog signal;

attenuator means responsive to said analog signal for controlling the degree of attenuation of an input signal;

rotary pulse generator means having a first output terminal, a second output terminal and a rotary operating knob for producing pulses on said first output terminal in response to rotation of said knob in one direction and for producing pulses on said second output terminal in response to rotation of said knob in a second direction opposite to said one direction, a said pulse being generated each time said knob is rotated through a given rotation angle and the frequency of said pulses depending on the rotational speed of said knob; and

logic circuit means coupled to said first and second output terminals of said pulse generator means for supplying said

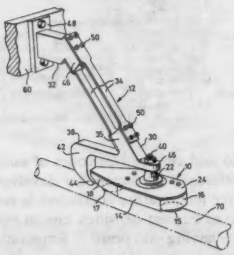
pulses from either of said output terminals to said clock input terminal of said counter, said up/down control terminal of said counter being coupled to one said output terminal of said generator to effect up/down count control of said counter.

4,349,780

SENSOR DEVICE FOR CONTINUOUS MEASUREMENT OF JACKET THICKNESS ON A CABLE

Bretislav Zuber, and Jaroslav J. Kral, both of Montreal, Canada, assignors to Northern Telecom Limited, Canada

Filed Nov. 13, 1979, Ser. No. 93,397
Int. Cl.³ G01R *33/00;* G01B *7/10*
U.S. Cl. 324—262 **4 Claims**



1. A device for the continuous measurement of the jacket thickness on a cable, comprising:

a head having at least two sensors providing a lower bearing surface of the head, the head carrying a flexible diaphragm assembly, the sensors being spaced apart one in advance of the other; and

a mounting arm lying in a plane normal to said bearing surface the arm comprising a parallelogram linkage of two parallel leaf springs, one end portion of the arm having an end member secured to the leaf springs, the end member being fixable to a base and the other end portion of the arm being fixed to the head through the diaphragm assembly whereby higher frequency vibrations in the head are prevented from being transferred to the arm, the arm extending obliquely from the head with respect to the lower bearing surface thereof and being laterally resilient by means of the leaf springs whereby the head is movable in an arc while maintaining the lower bearing surface of the head substantially parallel to a predetermined plane normal to said mounting arm plane when the arm is fixed to the base.

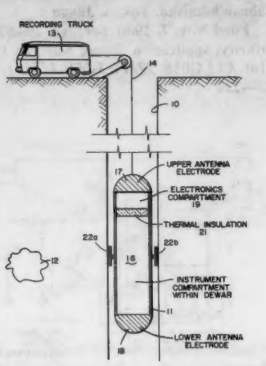
4,349,781

SUPERCONDUCTING GRADIOMETER-MAGNETOMETER ARRAY FOR MAGNETOTELLURIC LOGGING

Keeva Vozoff, Roseville, Australia, assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 7, 1980, Ser. No. 109,780
Int. Cl.³ G01V *3/26;* G01R *33/035*
U.S. Cl. 324—346 **7 Claims**

1. A subsurface electromagnetic field sensing device where the electrical conductivity of a portion of said subsurface is known comprising: supercooled vessel means for subsurface use containing magnetic gradiometer means for measuring at least one horizontal component of vector current density in the adjacent subsurface and containing magnetometer means for measuring a horizontal magnetic field component in at least one perpendicular direction relative to said vector current density; and means for utilizing said measured and determined quantities, as a function of frequency of the electromagnetic field, including said electrical conductivity in the immediate



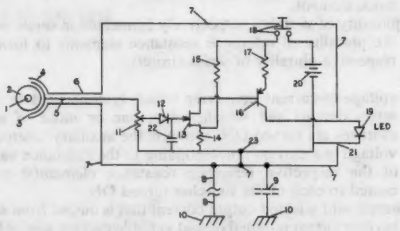
vicinity of said vessel, for determining the impedance of said underlying and surrounding subsurface region.

4,349,782

SHIELDED DIFFERENTIATOR FOR AUTOMOTIVE IGNITION APPLICATIONS

James D. Doss, 905 Tewa Loop, Los Alamos, N. Mex. 87544

Filed Nov. 21, 1980, Ser. No. 209,158
Int. Cl.³ F02P *17/00*
U.S. Cl. 324—390 **7 Claims**



1. A device which may be utilized to determine whether an arc is occurring in the high voltage section of an electric ignition system used on an internal combustion engine, comprising:

an electric probe assembly which consists of two electrodes; the first electrode being the probe inner electrode which may be capacitively coupled to an ignition system component such as a spark plug or spark plug cable wherein resultant capacitance is probe capacitance; the second electrode of said electric probe assembly is the shield electrode wherein said shield electrode is arranged to substantially shield said probe inner electrode from electric fields other than electric fields resulting from voltage on said ignition system component which is monitored by said electric probe assembly, and

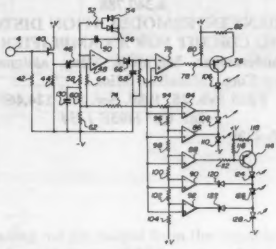
combination of said probe capacitance with appropriate means to develop a voltage signal which is substantially proportional to the rate of change of the voltage being monitored by said electric probe assembly on said ignition system component, and

further means to provide a visual indication whenever said rate of change of voltage exceeds a preset value.

4,349,783
GROUND ISOLATED ELECTROSTATIC FIELD DETECTOR

William F. Robson, St. Andrews West, Ontario, and Raymond A. Laperle, Boisvenue Dr., R.R. #1, Cornwall, Ontario, both of Canada

Filed May 17, 1978, Ser. No. 906,774
Claims priority, application Canada, Feb. 16, 1978, 297050
Int. Cl.³ G01R *5/28, 31/08*
U.S. Cl. 324—457 **9 Claims**

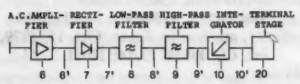


1. An electrostatic field indicator instrument circuit comprising:
(a) an amplifier having a high impedance input;
(b) an antenna connected via a conductor, which is unshielded with respect to ground, to said input;
(c) a low pass filter for blocking electrostatic field frequencies higher than the highest frequency of the field to be detected connected in a circuit path to the output of the amplifier;
(d) a lamp operation enabling circuit connected in a circuit path to the output of the low pass filter; and
(e) lamp indication means, connected between the poles of a battery and to said enabling circuit, for indicating particular levels of electrostatic field strength received by the antenna by comparing the output of said low pass filter with respectively-different potential levels representative of said particular levels of electrostatic field strength and generating respective indication signals in accordance therewith; and
in which the entire circuit is isolated from connection to ground.

4,349,784
DEVICE FOR MONITORING YARN MOTION ON A TEXTILE MACHINE

Erich Loepfe, Pfaffhausen, Switzerland, assignor to Gebrueder Loepfe AG, Zurich, Switzerland

Division of Ser. No. 943,526, Sep. 18, 1978, Pat. No. 4,256,247. This application Jun. 23, 1980, Ser. No. 161,738
Claims priority, application Switzerland, Oct. 5, 1977, 12160/77
Int. Cl.³ H03K *9/06*
U.S. Cl. 328—138 **1 Claim**

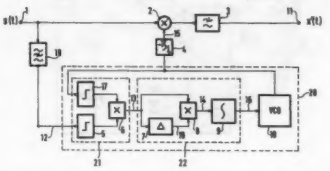


1. An electronic circuitry for evaluating electrical sensing signals furnished by a sensing device responsive to ballooning motion of a yarn in a textile machine and delivering a series of high frequency pulses having a repetition rate corresponding to the low frequency of the ballooning motion, the electric circuitry comprising a series arrangement of A.C.-amplifying means, rectifying means, low-pass filtering means having an upper cut-off frequency smaller than said high frequency but greater than the low frequency of the ballooning motion, high-pass filtering means having a cut-off frequency lower than the frequency of the ballooning motion, and means for detecting whether or not the output of the low-pass filtering means is a pulse series indicative of the frequency of the ballooning motion.

4,349,785
PHASE-CONTROLLING FEEDBACK CIRCUIT FOR SINGLE SIDEBAND DEMODULATION

Michel Lemoussu, Saint Michel sur Orge, and Claude Cardot, Gif sur Yvette, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 16, 1980, Ser. No. 187,643
Claims priority, application France, Sep. 19, 1979, 79 23306
Int. Cl.³ H03D *1/00;* **H03L** *7/08*
U.S. Cl. 329—50 **6 Claims**



1. A feedback circuit for controlling the phase of a local oscillator, the local oscillator providing an output local carrier wave for demodulating a data signal transmitted by single sideband amplitude modulation and having a control input for varying the phase of the output local carrier wave, the feedback circuit comprising:
a first input for receiving a first signal representative of the sign of the local carrier wave shifted by a phase of $\pi/4$;
a second input for a second signal representative of the sign of the data signal to be demodulated by the local carrier wave;
a sign multiplier connected to receive said first and second signals and to produce a product signal representative of the first signal multiplied by the second signal; and
sign coincidence auto-correlator means including a delay circuit connected to delay the product signal by an odd multiple of one fourth of the period of the carrier used for the amplitude modulation on transmission, to thereby provide two versions of the product signal, one version being delayed relative to the other by said odd multiple period, and means for providing an output signal representative of the correlation of said two versions, said output signal being applied to said control input of the local oscillator.

4,349,786
COMPLEMENTARY DIFFERENTIAL AMPLIFIER CIRCUIT HAVING SOURCE-FOLLOWER DRIVING CIRCUITS

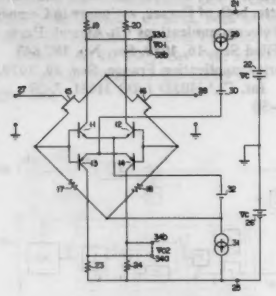
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 3, 1980, Ser. No. 203,512
Claims priority, application Japan, Nov. 15, 1979, 54-158629
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—253 **3 Claims**

1. An amplifier circuit comprising:
first and second field effect transistors having their drains coupled together and their gates coupled respectively to first and second input terminals to which an input signal to be amplified is applied;
first and second resistors having their first ends connected to sources of said first and second field effect transistors, respectively, and their second ends coupled together;
a first differential pair of first and second bipolar transistors of a first conductivity type having their emitters coupled

together and their bases connected to a first connection point of said first field effect transistor and said first resistor and a second connection point of said second field effect transistor and said second resistor, respectively;

a second differential pair of third and fourth bipolar transistors of a second conductivity type having their emitters coupled together and their bases connected to said bases of said first and second bipolar transistors, respectively;



a first constant voltage circuit connected between said drains of said first and second field effect transistors and said emitters of said third and fourth bipolar transistors; and

a second constant voltage circuit connected between said emitters of said first and second transistors and said second ends of said first and second resistors.

4,349,787

COMPRESSOR

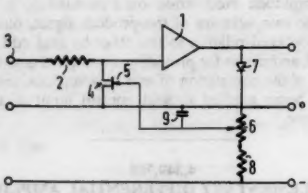
Robert R. Laupman, Wychen, Netherlands, assignor to Novanex Automation N.V., Wychen, Netherlands

Filed Feb. 6, 1980, Ser. No. 119,010

Claims priority, application Netherlands, Feb. 9, 1979, 7902045; Mar. 2, 1979, 7902683

Int. Cl.³ H03G *3/20*

U.S. Cl. 330—284 **9 Claims**



1. A compressor for use in an audio amplifier, comprising an amplifying means with an input and an output, and a compression circuit connected between the output and input, said compression circuit comprising a controllable semi-conductor device in the form of a FET connected between said input and a reference voltage lead of the compressor, the control electrode of which semiconductor device is connected through a control voltage control means to said output and also through a capacitor to the reference voltage lead, said control means being a transistor having a collector electrode, an emitter electrode and a base electrode, one of said emitter and base electrodes being connected to said output, the collector electrode to the control electrode and through a resistor to a negative voltage lead of the compressor and the other one of said base and emitter electrodes to the reference voltage lead, the control electrode being further connected through a resistor to one of said reference voltage lead and the input of the amplifying means, a circuit being provided between the output and input of the amplifying means, said last mentioned circuit comprising three parallel branches, the first of which comprises a resistor, the second at least one series-connected diode poled in one direction, and the third at least one series-connected diode poled in the opposite direction, there being provided a diode between the output of the amplifying means and one of said emitter and base electrodes of the transistor.

4,349,788

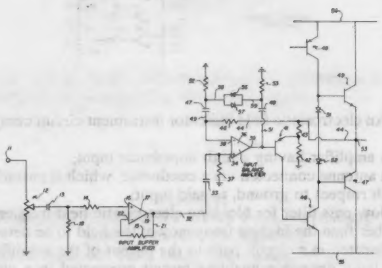
TRANSIENT INTERMODULATION DISTORTION LIMITING CIRCUIT FOR AN AMPLIFIER SYSTEM

Jack C. Sondermeyer, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.

Filed Feb. 25, 1980, Ser. No. 124,469

Int. Cl.³ H03F *1/34*

U.S. Cl. 330—293 **4 Claims**



1. A distortion limiting circuit for an amplifier system having supply rails comprising, in combination, an operational amplifier having an input port, a feedback port and an output port for providing an output signal, means for feeding an input signal to said amplifier input port, a gain stage connected to said amplifier output port for amplifying the output signal from said amplifier output port, a feedback network connected between said gain stage and said feedback port, and circuit means connected between said output port and said feedback port of said amplifier for reducing the slew rate recovery time of said amplifier to thereby reduce the amount of transient intermodulation distortion, said circuit means including a pair of diodes connected in oppositely poled, parallel relationship, and a pair of decoupling capacitors respectively coupling opposite sides of said pair of diodes to said feedback port and said output port of said amplifier.

4,349,789

STABILIZED SWEEP FREQUENCY GENERATOR WITH ADJUSTABLE START AND STOP FREQUENCIES

Takenori Kurihara, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,814

Claims priority, application Japan, Oct. 15, 1979, 54-131892

Int. Cl.³ H03B *23/00*; H03L *7/12*

U.S. Cl. 331—4 **27 Claims**

5. A sweep signal generating device comprising:

a variable frequency oscillator the oscillation frequency of which is controlled by a control signal;

a sweep signal generator for supplying the control signal to the variable frequency oscillator;

sweep start frequency setting means;

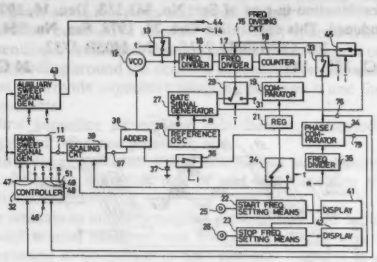
sweep stop frequency setting means;

a reference signal generator for generating a reference frequency signal;

sweep start frequency coincidence detecting means for detecting coincidence between the oscillation frequency of

the variable frequency oscillator and a sweep start frequency set in the start frequency setting means;

sweep stop frequency coincidence detecting means for detecting coincidence between the oscillation frequency of the variable frequency oscillator and a sweep stop frequency set in the stop frequency setting means; and



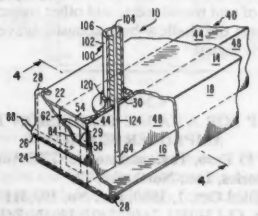
means for taking out the output from the variable frequency oscillator from the moment of detection of its coincidence with the sweep start frequency to the moment of detection of its coincidence with the sweep stop frequency.

4,349,790

COAX TO RECTANGULAR WAVEGUIDE COUPLER

Norman R. Landry, Mount Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 17, 1981, Ser. No. 255,282
Int. Cl.³ H01P *1/195, 5/103*
U.S. Cl. 333—24.1 **7 Claims**



1. A coax to waveguide coupler comprising:

a rectangular waveguide having first and second broad walls spaced apart by first and second narrower walls, said waveguide being dimensioned for operation over a selected frequency range;

a body of dielectric material disposed between said broad walls for loading said waveguide, said body positioned between the narrower walls of said waveguide, having a cross-sectional dimension substantially less than the width of said waveguide, and having first and second lateral walls generally parallel to said narrower walls of said waveguide;

a coaxial transmission line terminated at said first broad wall of said waveguide, said first broad wall of said waveguide having an aperture at said termination, said termination being adjacent said first lateral wall of said body;

a short circuit termination at one end of said rectangular waveguide;

a probe coupled to the center conductor of said coaxial transmission line;

said body having a slot along said first lateral wall adapted to receive said probe, and

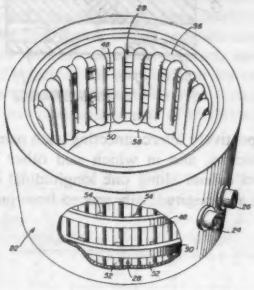
said probe extending through said aperture and being disposed in said slot.

4,349,791

SLOW WAVE COUPLING CIRCUIT

Lawrence J. Nichols, Burlington, and George H. MacMaster, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 967,811, Dec. 8, 1978, abandoned. This application Aug. 21, 1980, Ser. No. 180,221
Int. Cl.³ H01P *1/18, 5/04, 9/02, 9/04*
U.S. Cl. 333—27 **22 Claims**



1. A coupling circuit comprising:

an outer slow wave structure;

an inner slow wave structure;

said outer slow wave structure having a generally cylindrical form, and said inner slow wave structure having a generally cylindrical form;

said outer slow wave structure enclosing at least a portion of said inner slow wave structure and being disposed adjacent the inner slow wave structure for directly coupling radiant energy from one of said structures to the other one of said structures, a cylindrical axis of said outer slow wave structure being parallel to a cylindrical axis of said inner slow wave structure;

said inner slow wave structure being configured to support a slow wave having a phase velocity of a first magnitude, and said outer slow wave structure being configured to support a slow wave having a phase velocity of a second magnitude, said first and second magnitudes being proportional respectively to the circumference of said inner slow wave structure and the circumference of said outer slow wave structure to provide synchronization of a wavefront on said inner slow wave structure with a wavefront on said outer slow wave structure; and

means for applying radiant energy to one of said slow wave structures and means for extracting radiant energy from a second one of the slow wave structures.

4,349,792

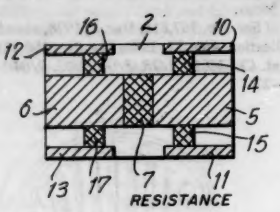
PI PAD ATTENUATOR

Harry Scheiner, New City, N.Y., assignor to Kings Electronics Co., Inc., Tuckahoe, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,682
Int. Cl.³ H01P *1/22*
U.S. Cl. 333—81 A **2 Claims**

1. A pi pad attenuator comprising an insulating substrate, a pair of transversely spaced, longitudinally extending input conductors printed on said substrate, of which one input conductor is centrally positioned and extends from one end of the substrate in a substantially straight line only partially the length of the substrate, a pair of transversely spaced, longitudinally extending output conductors printed on said substrate, of which one output conductor is centrally positioned and extends from the other end of said substrate in a substantially straight line only partially the length of said substrate and in alignment with said one input conductor, a first discrete area of

resistive material on said substrate interconnecting the opposed ends of said one input and output conductors, and second and third individual discrete areas of resistive material in said sub-



strate respectively interconnecting each pair of input and output conductors, and in which said other input and output conductors extend along one longitudinal edge of said substrate and are longitudinally spaced from one another.

4,349,793

ADJUSTABLE DIRECTIONAL COUPLER HAVING TILTABLE COUPLING CONDUCTOR

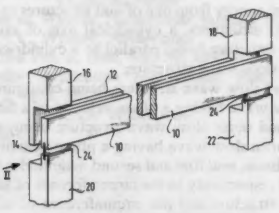
Georg Spinner, Am Eichberg 12, D-8152 Feldkirchen-Westerham 1, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,276

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2946989

Int. Cl.³ H01P *5/04, 5/18*

U.S. Cl. 333—111 **14 Claims**



1. A coaxial directional coupler, comprising:

a first and a second elongate coupling conductor guided in air, and each coupling conductor having a respective facing side facing toward the facing side of the other coupling conductor; an adjustable coupling air gap being defined between the facing sides of the coupling conductors;

for each of the coupling conductors, two respective inner conductor terminals are defined at separated locations along the respective coupling conductor; the inner conductor terminals are rigid and non-deformable and non-shiftable under mechanical force applied to the respective coupling conductors;

for at least one of the coupling conductors, resiliently deformable means are defined between both of the respective rigid inner conductor terminals and the coupling conductor, and the deformable means form tilting joints, and the tilting joints have axes which extend parallel to the axes of the coupling conductors and the axis of the air gap, whereby application of a mechanical force to the one coupling conductor will tilt it at the tilting joints for adjusting the air gap and the mutual separation of the coupling conductors.

4,349,794

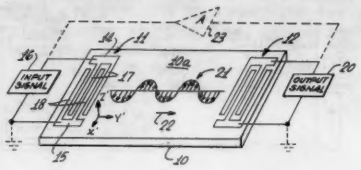
SHALLOW BULK ACOUSTIC WAVE DEVICES

Reynold S. Kagiwada, Los Angeles; Kuo-Hsiung Yen, Manhattan Beach; Ke-Li Wang; Kei F. Lau, both of Harbor City; Donald L. Lochhead, Rancho Palos Verdes, and James A. Leaverton, Huntington Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 861,133, Dec. 16, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,149

Int. Cl.³ H03H *9/15, 9/36;* **H03B** *5/32*

U.S. Cl. 333—141 **24 Claims**



1. A shallow bulk acoustic wave device comprising:

a block of anisotropic piezoelectric material having a surface, having physical properties which may be defined by reference to a set of orthogonal crystallographic axes, and being capable of propagating surface acoustic waves and shallow bulk acoustic waves; and

a pair of electroacoustic transducers disposed on said surface and so oriented with respect to said crystallographic axes that the electromechanical coupling coefficient for surface acoustic waves is substantially zero while the electromechanical coupling coefficient for shallow bulk acoustic waves is relatively large, whereby when an electric signal is applied to one of said transducers, a shallow bulk acoustic wave is launched in said block and propagated toward the other of said transducers, said other transducer serving to transform the shallow bulk acoustic wave into an output electric signal.

4,349,795

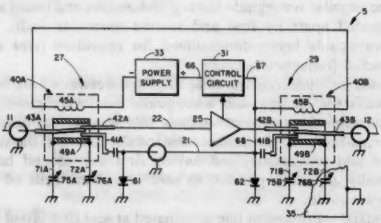
RF TRAP FOR A CABLE TELEVISION TRUNK AMPLIFIER STATION

Sai W. Kwok, El Paso, Tex., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Oct. 1, 1980, Ser. No. 193,311

Int. Cl.³ H03H *7/46, 7/01;* **H04N** *7/10*

U.S. Cl. 333—176 **18 Claims**



1. Apparatus responsive to the absence and presence of a control signal for selectively passing first RF signals with first frequencies in a first prescribed frequency band on a main transmission line to first and second lines, respectively, and for passing second RF signals with second frequencies that are in a second prescribed frequency band that is greater than frequencies in the first frequency band, away from the lines, comprising:

first switch means having a first, second and third elongated terminal contacts with one ends electrically connected to

the first, second and main lines, respectively; the other ends of the first and third contacts making an electrical connection therebetween in the absence of a control signal for passing the first signal along the main and first lines;

first means responsive to the presence of the control signal for causing the second and third contacts to make an electrical connection therebetween for passing the first signals along the main and second lines;

a tubular conductive member electrically spaced from, extending over at least a major portion of the lengths of, and extending around the contacts of said first switch means so as to provide capacitive coupling between it and the said contacts;

a first capacitor having one side thereof connected to a ground reference potential; and

a first length of electrically conductive wire electrically connecting the other side of said first capacitor to said tubular member;

the reactances and/or coupling provided by said capacitor, said tubular member, said contacts, and said wire being selected to cooperate so the apparatus operates as a trap for passing the second signals on said lines to ground.

4,349,796

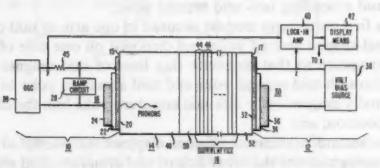
DEVICES INCORPORATING PHONON FILTERS

Maurice A. Chin, South Plainfield; Venkatesh Narayanamurti, and Horst L. Störmer, both of Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1980, Ser. No. 216,172

Int. Cl.³ H03H *9/24, 9/46, 9/12*

U.S. Cl. 333—186 **19 Claims**



1. A phonon device comprising

a semiconductor body in which phonons over a range of wavelengths can be made to propagate simultaneously,

source means coupled to said body for exciting said phonons to propagate therein, and

filter means coupled to said body so as to intercept said phonons and to transmit phonons in a particular sub-range of said wavelengths and to reflect phonons outside said sub-range, said filter means comprising an acoustic superlattice of essentially lattice-matched semiconductor layers of alternating acoustic impedance.

4,349,797

PHASE-COMPENSATED INTEGRATED CIRCUIT

Roger S. Thompson, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

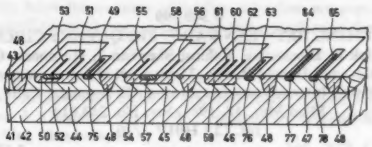
Filed May 5, 1980, Ser. No. 146,972

Claims priority, application United Kingdom, May 10, 1979, 7916196; Apr. 3, 1980, 8011440

Int. Cl.³ H01L *27/04*

U.S. Cl. 333—215 **8 Claims**

1. An integrated circuit comprising a transisitor, a phase-shifting arrangement which produces a phase shift which is controllable by applying a control signal to a control input thereof, which arrangement is included in a signal path which extends through said transistor, and a control signal generator circuit the output of which is coupled to said control input, said control signal generator circuit including a circuit element comprising doped zones which correspond to the collector, base and emitter zones of the transistor, respectively, said element being included in the control signal generator circuit in such manner that the value of the output signal of said generator circuit will be a function of the value of an electrical property of said element, characterized in that said circuit element is a resistor and said electrical property is the resistance of said resistor, said transistor comprising a first region of one conductivity type provided with an electrical contact, a first region of the opposite conductivity type formed in the first region of the one conductivity type and provided with an electrical contact, and a second region of said one conductivity type formed in the first region of the opposite conductivity type and provided with an electrical contact, said resistor comprising a third region of the one conductivity type, a second region of the opposite conductivity type formed in said third region and provided with a pair of electrical contacts



which constitute the terminals of said resistor, and a fourth region of the one conductivity type formed in the second region of the opposite conductivity type, the first and third regions of the one conductivity type being formed during the same doping step, the first and second regions of the opposite conductivity type being formed during the same doping step, and the second and fourth regions of the one conductivity type being formed during the same doping step, so that the resistance between the pair of contacts will become larger as the base width of said transistor becomes smaller, the coupling from the output of said control signal generator circuit to said control input having such a sense that signals transmitted through said signal path will be subjected to a phase shift in said arrangement which is larger in the phase lead sense or smaller in the phase lag sense as the value of said width increases and hence as the value of said resistor decreases.

4,349,798

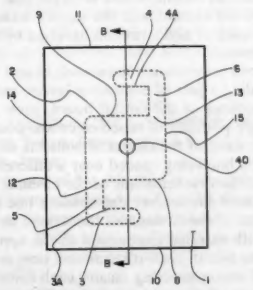
COMPACT MICROWAVE RESONANT CAVITY FOR USE IN ATOMIC FREQUENCY STANDARDS

Allen F. Podell, and Louis F. Mueller, both of Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1980, Ser. No. 174,085

Int. Cl.³ H01P *7/06;* H01S *1/06;* H03L *7/26*

U.S. Cl. 333—230 **10 Claims**



1. A resonant cavity comprising a block of electrically conductive material having:

a primary cavity extending through the block along a primary axis;

first and second secondary cavities located on opposite sides of the primary cavity, each extending through the material along secondary axes which are substantially parallel to the primary axis;

first and second access channels interconnecting the first and second secondary cavities with the primary cavity, respectively, each of the channels extending through the material along tertiary axes which are substantially parallel to the primary axis; and

top and bottom cover means in contact mainly at their peripheries with the top and bottom of the block, respectively, for covering the cavities and for providing extended top and bottom access channels between cavities,

wherein said top and bottom cover means have an aperture for an optical axis.

4,349,799

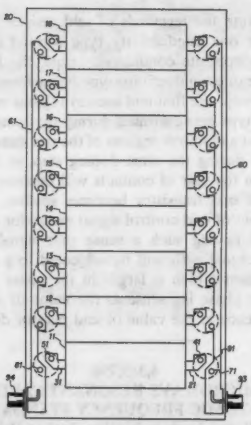
SWITCHING BETWEEN RADIO FREQUENCY CIRCUITS

Roderick K. Blocksome, Robins; Sherman J. Hornbeck, Cedar Rapids, and Donald R. Fee, Marion, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 12, 1981, Ser. No. 243,014

Int. Cl.³ H01P 1/10

U.S. Cl. 333—246 **2 Claims**



1. Apparatus for selecting between a plurality of radio frequency circuits, comprising:

a printed circuit board having said circuits mounted thereon, each of said circuits having first and second printed conductor terminals on said board, with the first terminals on one side of the circuits and the second terminals on the other side, each of said terminals having a raised electrical contact thereon;

first and second transmission lines, each of said transmission lines including a pair of conductor layers, each on one of the two surfaces of the circuit board, each transmission line having a plurality of raised electrical contacts spaced therealong, each of the electrical contacts along said first transmission line being spaced near a different one of the contacts of the first terminals of the circuits, and each of the contacts of the second transmission line being near a different one of the contacts of the second terminal of the circuits, with external connection to the apparatus being made at one end of each transmission line; and

a plurality of interconnecting means, each associated with a different pair of the raised contacts formed by a raised contact of one the circuit terminals and the nearby transmission line raised contact, including a resilient conducting member and means for pressing the member against the associated pair of raised contacts to interconnect the contacts and for pulling the member away from the raised contacts to disconnect the contacts.

4,349,800

MAGNETIC PROXIMITY SWITCH

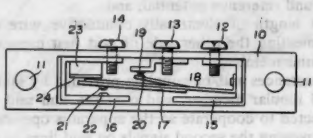
Shigeo Shimoya, Tokyo, Japan, assignor to Kobishi Electric Co., Ltd., Japan

Filed Nov. 29, 1979, Ser. No. 98,637

Claims priority, application Japan, Jul. 6, 1979, 54-85778

Int. Cl.³ H01H 9/00

U.S. Cl. 335—207 **2 Claims**



1. A magnetic proximity switch which comprises:

a. a casing of non-magnetic material;

b. a pair of first and second yokes of magnetic material having a channel-shaped cross-section and open toward each other and secured to said casing in spaced apart relation to each other;

c. an armature of resilient material with an armature yoke adhered thereto along the length thereof and secured to said first yoke at one end thereof, said armature being movable between open and closed positions of the switch and extending into said second yoke;

d. a first permanent magnet secured to one arm of said channel-shaped second yoke and disposed on one side of said armature so that magnetic flux lines of said magnet pass through said second yoke and said armature yoke to normally magnetically bias said armature yoke into the closed position; and

e. a second permanent magnet disposed exteriorly of said casing and one the other side of said armature, said second magnet being movable toward said yokes so that magnetic flux lines of said second magnet pass through said second yoke, said armature yoke and said first yoke to magnetically bias said armature yoke into the open position, the magnetic flux lines of said first and second magnets being in the same direction in said armature yoke to enhance the magnetic biasing of said armature yoke into the open position.

4,349,801

SINGLE-PHASE TRANSFORMER WITH WINDINGS CAST IN CASTING RESIN

Garhard Altmann, Kirchheim, and Richard Pfeiffer, Stein-Deutenbach, both of Fed. Rep. of Germany, assignors to Transformatoren Union AG, Stuttgart, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,454

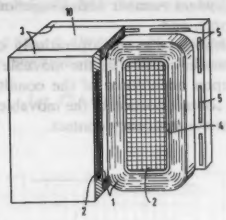
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938792

Int. Cl.³ H01F 15/04, 27/02

U.S. Cl. 336—84 C **6 Claims**

1. Single-phase transformer, comprising windings being wound around an axis and cast in resin forming a cast resin body, said cast resin winding body having an outer surface and a rectangular window formed therein with sides disposed in given planes, a wound core formed of tape material extended through said window, two flanges being cast with and integral with said cast resin winding body on opposite sides thereof and parallel to said winding axis and to said window, said flanges having outer edges, mutually parallel inner surfaces substantially disposed in the plane of the narrow sides of said window and grooves formed in said inner surfaces in the vicinity of and

parallel to said outer edges, an encapsulation for said wound core being anchored in said grooves, and a grounded metallization layer formed on said surface of said cast resin winding body at least immediately adjacent to said wound core.

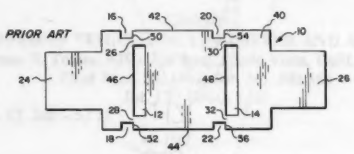


4,349,802

CURRENT LIMITING FUSE HAVING TRANSVERSE PARALLEL WEAK SPOTS

Aldino J. Gaia, St. Louis, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jan. 8, 1981, Ser. No. 223,391
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—159 **6 Claims**



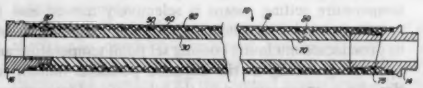
1. A fuse comprising an elongated electrically conductive, fusible strip, said strip having first and second opposite end portions, a main body portion joining said end portions and longitudinal edges defining the width of said main body portion, said main body portion defining first and second generally semi-circular apertures arranged in longitudinally spaced relation, between said longitudinal edges, the diametric edges of said semi-circular apertures extending transverse to said longitudinal edges of said strip, said main body portion including areas which are predeterminedly less conductive than the remaining areas of said fusible strip, the electrically less conductive areas being disposed between said longitudinal edges and said semi-circular apertures.

4,349,803

FUSE TUBE

Thomas J. Tobin, Northbrook, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed May 4, 1981, Ser. No. 260,451
Int. Cl.³ H01H *85/20*
U.S. Cl. 337—186 **7 Claims**



1. An improved fuse tube for a fuse, the fuse tube having a bore in which a fusible element is locatable, the bore walls including an arc-extinguishing medium, wherein the improvement comprises:

an inner, bore-defining fuse tube portion molded from a thermosetting material having an effective amount of an arc-extinguishing material therein;

an outer, weather-resistant fuse tube portion molded simultaneously with and from the same materials as the inner portion, the inner and outer portions being merged together and forming an integral continuum of the thermosetting material; and

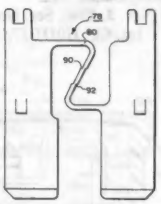
a layer of porous reinforcement material incorporated between the portions during the simultaneous molding of both portions, the reinforcement material being sufficiently porous to permit both (a) passage therethrough of the thermosetting material of both portions during molding and (b) thorough impregnation thereof from both sides with the thermosetting material to lock both portions thereto and to each other and to form a mechanically strong fuse tube, the porous reinforcement material layer being sufficiently remote from the bore so that errosion of the bore due to usage of the fuse tube does not expose the reinforcement material at the interior surface of the bore.

4,349,804

FUSE ASSEMBLY FOR A MINIATURE PLUG-IN FUSE

Aldino J. Gaia, St. Louis, Mo., assignor to McGraw-Edison, Rolling Meadows, Ill.

Filed May 29, 1981, Ser. No. 268,233
Int. Cl.³ H01H *85/02*
U.S. Cl. 337—198 **15 Claims**



1. In a miniature fuse, an integrally-formed plug-in fuse assembly comprising:

at least two generally parallel elongated spaced-apart conductive legs having first and second ends and lying in a common plane and including at least two plug-in members in said first ends of said conductive legs;

a fusible portion extending between said conductive legs adjacent said second ends, said fusible portion including an elongated strip having a longitudinal axis;

at least one weak spot formed in said strip, said weak spot including first and second portions of said strip, said first and said second portions having predetermined widths and being offset from each other in a direction generally transverse to said longitudinal axis of said strip, such that said weak spot has essentially zero length.

4,349,805

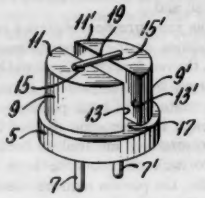
QUICK-ACTING MICRO-FUSE

Hiroo Arikawa, Tokyo, Japan, assignor to San-O Industrial Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 93,378, Nov. 13, 1979, Pat. No. 4,267,543. This application May 12, 1980, Ser. No. 149,590
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.
Int. Cl.³ H01H *85/48*
U.S. Cl. 337—255 **5 Claims**

1. A quick-acting micro-fuse comprising a fuse base and body, a fuse cover, a pair of electrically conductive lead wires, the lower ends of which protrude from said base and the upper ends of which are embedded into said fuse base and body, a

pair of opposed, spaced apart and generally crescent-shaped members, each of said members being defined by an outwardly curved surface, generally flat top and bottom surfaces and a generally perpendicular inner wall, wherein said inner walls are spaced apart and in facing relation to one another and



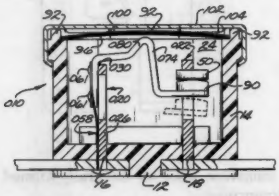
wherein the upper ends of said electrically conductive lead wires terminate at about the same level as said top surfaces of said crescent-shaped members, and a fusible element stretched between said upper ends of the electrically conductive lead wires and secured thereto at each end.

4,349,806

SNAP-ACTING THERMOSTATIC SWITCH USING INFLEXIBLE, SPRING BIASED CONTACT ARM

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1980, Ser. No. 203,790
Int. Cl.³ H01H *37/54*
U.S. Cl. 337—343 **26 Claims**



12. A condition responsive switch comprises an open-ended, cup-shaped housing formed of electrically insulative material, the housing having a bottom wall and a side wall extending from the bottom wall and terminating at a free distal end, the bottom and side wall defining a switch cavity therein, the bottom wall formed with first and second apertures extending therethrough,

a first member formed of electrically conductive material having a first and second ends disposed in the first aperture and extending into the switch cavity and terminating at the first end, the member having a spring seating surface disposed intermediate its first and second ends,

a movable contact member formed of electrically conductive material comprising a spring engaging portion, a contact portion and a pivot portion and motion transfer portion intermediate the spring engaging portion and the contact portion, the pivot portion disposed on the first end of the first member,

a second member formed of electrically conductive material disposed in the second apertures and extending into the switch cavity, the second member mounting thereon a stationary contact,

a spring member having first and second end portions, the first end portion engaged with the spring seating surface of the first member on a side of the first member facing the second member and the second end portion engaged with the spring engaging portion of the movable contact member disposed on the side of first member remote from the second member, the spring member biasing the contact portion of movable contact member toward the stationary contact with a relatively low contact force and biasing the movable contact member with a high force relative to the contact force, and

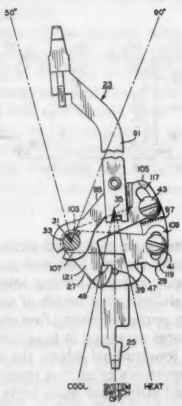
condition responsive means operatively connected to the motion transfer portion of the movable contact member adapted upon occurrence of the condition to pivotably move the contact portion of the movable contact member away from the stationary contact.

4,349,807

HEATING AND COOLING THERMOSTAT WITH ADJUSTABLE LIMITS AND METHODS OF MANUFACTURING AND OPERATING THE THERMOSTAT

Ralph W. Gustafson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 845,383, Oct. 25, 1977, Pat. No. 4,274,072. This application Sep. 15, 1980, Ser. No. 187,088
Int. Cl.³ H01H *37/22*
U.S. Cl. 337—360 **33 Claims**



2. A thermostat adapted to regulate the temperature of a given space comprising:

means for selecting an operating mode of the thermostat and movable at least between a heating mode position and a cooling mode position;

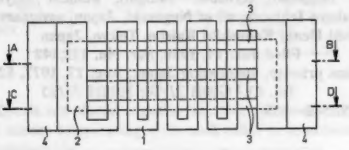
means selectively movable for setting a selected operating temperature of the thermostat and having a preselected maximum heating set point temperature and a preselected minimum cooling set point temperature; and

a pair of means separately adjustably movable with respect to at least one of said temperature setting means and said mode selecting means into adjusted positions when the temperature setting means is selectively moved into its preselected maximum heating set point temperature and its preselected minimum cooling set point temperature and operable generally in the adjusted positions thereof for abutting in engagement with the other of said temperature setting means and said mode selecting means when said mode selecting means is in its heating mode position and its cooling mode position so as to define the preselected maximum heating set point temperature and the preselected minimum cooling set point temperature of said temperature setting means, respectively.

4,349,808
BOLOMETER

Heinz Kraus, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,842
Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920901
Int. Cl.³ H01L *31/08*
U.S. Cl. 338—18 8 Claims

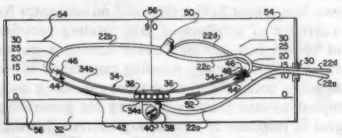


1. A bolometer arrangement comprising: a meander-shaped electrically conductive layer having a resistance dependent on the intensity of absorbed radiation; a supporting layer for supporting said meander-shaped conductive layer and having cutouts for receiving portions of said meander-shaped conductive layer, said supporting layer being comprised of photoresist.

4,349,809
OFFROAD VEHICLE INCLINOMETER AND ALARM

Marcus B. Tomes, 625 - 2nd Ave., Chula Vista, Calif. 92010

Filed Mar. 30, 1981, Ser. No. 248,854
Int. Cl.³ B60Q *5/00*
U.S. Cl. 340—52 H 7 Claims

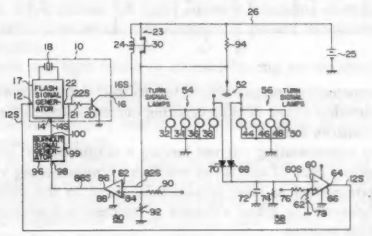


1. An inclinometer and alarm apparatus for a vehicle comprising:
- an elongate, pliant tubular member made of an electrically conductive material and having an intermediate segment and a pair of upwardly inclined end segments;
- a vertical panel;
- means for mounting the intermediate segment of the tubular member to the panel with the end segments of the tubular member inclined upwardly;
- indicia on the panel for providing an indication of the degree of inclination of the end segments of the tubular member with respect to the intermediate segment of the tubular member;
- a pair of contact points made of an electrically conductive material inserted into the opposite ends of the tubular member;
- means for electrically insulating the contact points from the tubular member;
- a plurality of spherically shaped contact elements made of an electrically conductive material positioned within the tubular member and adapted to move longitudinally therein into contact with the contact points upon a predetermined degree of rotation of the vertical panel about an axis perpendicular to the panel;
- a quantity of a lubricant within the tubular member;
- electrical indicator means for providing a human perceivable warning signal upon energization; and
- electrical circuit means for connecting the tubular member, the contact points and the electrical indicator means to a source of electric current so that the electrical indicator means will be energized when the contact elements move into contact with the contact points;
- whereby when the vehicle exceeds a predetermined safe limit of inclination set by bending the end segments of the tubular member a predetermined amount upwardly with respect to the intermediate segment, the electrical indicator means will provide a warning signal, while jolting of the vehicle as it is driven over rough terrain will not cause a false alarm.

4,349,810
SIGNAL LAMP APPARATUS WITH A LAMP BURNOUT DETECTING CIRCUIT

Masaru Kugo, Ibaraki, and Osamu Igarashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1980, Ser. No. 139,670
Claims priority, application Japan, Apr. 16, 1979, 54-45414
Int. Cl.³ B60Q *1/38;* G08B *21/00*
U.S. Cl. 340—79 7 Claims



3. A signal lamp apparatus with a lamp burnout detecting circuit comprising:
- a power source;
- a plurality of signal lamps connected in parallel with each other and connected to one side of said power source in series;
- a relay having a pair of contacts connected between the other side of said power source and said signal lamps;
- flash signal generator means for alternately opening and closing the contacts of said relay at a predetermined frequency;
- a resistor for detecting the burnout of the lamp which is connected to one of the contacts of said relay and to said signal lamps;
- a comparator with a first input terminal connected to a connecting point between the other contact of said relay and said signal lamps, a second input terminal supplied with a predetermined reference voltage, and an output terminal, which comparator produces an output signal when the voltage at the first input terminal is higher than that at the second input terminal;
- means connected to the output terminal of said comparator for producing a burnout signal when said comparator produces an output signal after a predetermined period of time following the time said relay contacts open.

4,349,811
DIGITAL-TO-ANALOG CONVERTER WITH IMPROVED COMPENSATION ARRANGEMENT FOR OFFSET VOLTAGE VARIATIONS

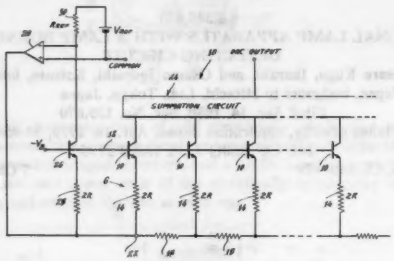
Adrian P. Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Jul. 30, 1980, Ser. No. 173,450
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA 9 Claims

1. In a digital-to-analog converter of the type including a

plurality of transistors serving as current sources and having equal emitter areas, means connecting the bases of said transistors together, an R–2R ladder network with the shunt resistors thereof connected to respective current-source emitters to provide for binary weighting of the transistor currents, and a source of excitation voltage connected to said ladder network to develop said binary-weighted currents through said transistors;

that improvement for minimizing errors due to offset voltages in the transistors, comprising:



compensating means connected to said ladder network to develop a flow of compensating current through the series resistors thereof;

said compensating current having a magnitude to produce across each of said series resistors a compensating voltage component at least substantially equal to the difference between the offset voltages of successive transistor current sources.

4,349,812

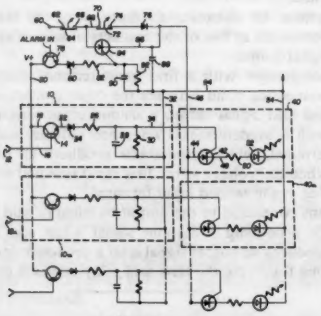
MULTIPLE DETECTOR ALARM LATCH AND RELEASE SYSTEM

William E. Healey, Bloomfield Hills, Mich., and Morse R. Heineman, White Rock, N. Mex., assignors to W. E. Healey and Associates, Inc., Bloomfield Hills, Mich.

Continuation-in-part of Ser. No. 187,355, Sep. 15, 1980, abandoned. This application Feb. 11, 1981, Ser. No. 233,684

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—522 **11 Claims**



10. A method of monitoring a plurality of detectors, each of which detectors has an untriggered state and a triggered state comprising the steps of:

illuminating a visible display when a detector changes from an untriggered state into a triggered state;

latching said visible display in an illuminated condition so that said illuminated display remains illuminated when the detector switches back to an untriggered state;

providing a first release for releasing said latched illuminated display to remove the illumination therefrom; and

providing a second release to by-pass said first release, said second release for both removing the illumination from said latched illuminated display and for preventing inadvertent turning off of the illuminated display caused by actuation of said first release.

4,349,813

BLOWN FUSE SENSOR

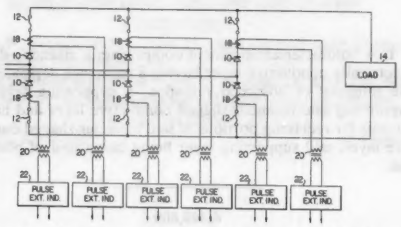
Naoto Ishibashi; Ryosuke Taniguti; Junichi Miyaji, and Yosaburo Ichinose, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1980, Ser. No. 112,142

Claims priority, application Japan, Aug. 17, 1977, 52/98902

Int. Cl.³ G08B *21/00*; H02H *7/125*

U.S. Cl. 340—638 **2 Claims**



1. A rotary electric machine comprising: a rotor; an AC source disposed on said rotor; a DC load disposed on said rotor; and a rotating rectifier device disposed on said rotor connecting said AC source to said DC load and including a series connection rectifier and a fuse; and

a blown fuse sensor device disposed on said rotor for sensing occurrence of a failure of said rotating rectifier device, said blown fuse sensor device having a current transformer with a primary winding connected in series with said series connection, a secondary winding magnetically coupled to said primary winding for generating a pulse signal in response to a pulsating current flowing through said series connection, circuit means electrically coupled to said secondary winding for producing a signal indicative of the occurrence of a blowing of a fuse in response to an absence of said pulse signal for a predetermined period of time, an electrically insulating transformer connected between said secondary winding and said circuit means.

4,349,814

ELECTRIC SWITCHES

Douglas J. Akehurst, Hythe, England, assignor to Duraplug Electricals Limited, Broadstairs, England

Filed Oct. 3, 1980, Ser. No. 193,639

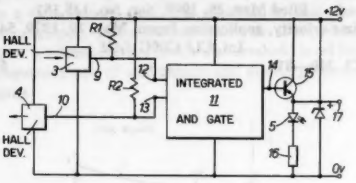
Claims priority, application United Kingdom, Oct. 8, 1979, 7934846

Int. Cl.³ G08B *19/00*; H01L *29/82*

U.S. Cl. 340—679 **9 Claims**

1. An electric switching device comprising two separate relatively movable parts, a first one of said parts including a housing having operative face means, at least two Hall effect devices fixed in the housing adjacent said operative face means and reversed in physical relationship to each other so as to be actuated by magnetic poles of opposite polarity presented against said face means, an electrical circuit including said Hall effect devices and electronic switching means having a normally conducting or non-conducting state and connected electrically to said Hall effect devices to change from said normal state to the opposite state only when all the Hall effect devices are actuated simultaneously, the other part of the device including operative face means adapted to cooperate with the

face means of the first part, and a plurality of magnetic pole means fixed in position with respect to said face means for actuating respective Hall effect devices in said one part when



said two parts are placed together in close proximity and with said face means cooperating with each other in predetermined spatial relationship.

4,349,815

HEAD-MOVABLE FRAME-SCANNER FOR HEAD-COUPLED DISPLAY

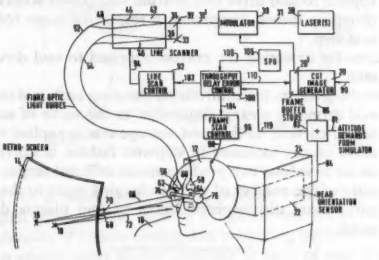
Archer M. Spooner, Orlando, Fla., assignor to Redifon Simulation Limited, Sussex, England

Filed Jan. 11, 1980, Ser. No. 111,284

Claims priority, application United Kingdom, Jan. 11, 1979, 7901007

Int. Cl.³ G09G *3/02*

U.S. Cl. 340—705 **11 Claims**



1. For apparatus providing a viewer with a wide-angle, television-type raster scanned image projected upon a concave screen by deflecting a light spot of modulated intensity to form a scanned line and deflecting successive scanned lines to form the changing raster scanned image, fixed line scanning means, frame scanning means movable with the viewer and intermediate flexible light guide means comprising a fibre optic light guide having groups of fibres thereof fanned at the input and output ends of the light guide into concave arcuate shape, the fibre groups corresponding in number to individual image spot elements of a single instantaneous scan line and being arranged in the same relative sequence at both input and output ends, said line scanning means comprising rotatable mirror means positioned to reflect an incident modulated light beam over the arcuate configuration of fibres at the input end of the light guide means, thereby to scan one line of the raster scanned image, said frame scanning means comprising angularly movable mirror means positioned at the output end of the light guide for frame scanning successive lines of the raster scanned image and said apparatus further comprising projection lens means positioned between the output end of the light guide means and the frame scanning mirror means for focussing the output ends of the fibres onto the said screen.

4,349,816

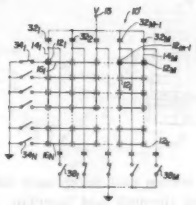
DRIVE CIRCUIT FOR MATRIX DISPLAYS

M. Robert Miller, Neptune, and Richard P. Tuttle, Wall, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 27, 1981, Ser. No. 248,666

Int. Cl.³ G09G *3/30*

U.S. Cl. 340—781 **14 Claims**



1. A drive circuit for light emissive elements electrically energizable from an electrical source of power, comprising in combination:

at least one light emissive element having an electrical capacitance of a predetermined value;

first electrical capacitive means having a capacitive value relatively greater than the capacitance value of said light emissive element;

first electrical switch means being operable in one of two operating states to couple said at least one light emissive element in series circuit relationship with said first electrical capacitance means across said source of power whereby a capacitive voltage divider action occurs to apply a voltage of sufficient magnitude across said light emissive element to energize said element;

second electrical capacitance means also having a capacitance value relatively greater than the capacitance value of said light emissive element; and

second electrical switch means being operable in one of two operating states to couple said second electrical capacitance means in parallel circuit relationship with said light emissive element whereby a capacitive voltage divider action occurs to apply a voltage of insufficient magnitude across said light emissive element to energize said element when said first switch means is also in its said one operating state.

4,349,817

LIQUID CRYSTAL DISPLAY SYSTEM USING FIBER OPTIC FACEPLATES

William C. Hoffman, 23217 Wade Ave., Torrance, Calif. 90505; John E. Gunther, 21217 S. Harvard, Torrance, Calif. 90501, and William R. Lichty, 6001 Canterbury Dr., Culver City, Calif. 90230

Filed Jan. 28, 1980, Ser. No. 116,364

Int. Cl.³ G09G *3/36*

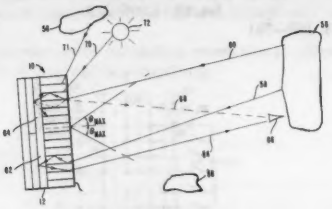
U.S. Cl. 340—784 **13 Claims**

1. In an image projection system wherein a light source illuminates the display surface of a reflective liquid crystal light valve operating in the dynamic scattering mode, and a projection lens images said display surface onto a projection screen, the improvement comprising:

(a) a fiber optic faceplate adjacent said liquid-crystal display surface, said faceplate having a multiplicity of straight and rigid optical fibers whose longitudinal axes are parallel to each other and perpendicular to the faces of said faceplate whereat they all terminate and to said liquid-crystal display surface so as to provide a direct and undistorted light path to and from said display surface, each of said fibers having an acceptance cone which defines exclusively the angle of incident light transmitted in either direction by

said fibers, said acceptance cone being substantially smaller than the one-state scattering cone of said liquid-crystal display surface; and

(b) means for directing light from said light source onto said



faceplate within said acceptance cone, whereby light is transmitted through said faceplate to said liquid crystal display surface where at least a portion of said light is directed back through said faceplace so as to be imaged by said lens onto said projection screen.

4,349,818

ELECTROCHROMIC DISPLAY DEVICE

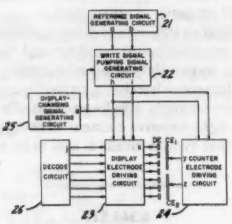
Noboru Kaneko, and Junichi Tabata, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jul. 3, 1980, Ser. No. 165,502

Claims priority, application Japan, Jul. 4, 1979, 54-084860

Int. Cl.³ G09G *3/34*

U.S. Cl. 340—785 **11 Claims**



1. An electrochromic display device comprising: an electrolyte held between two substrates at least one of which is transparent; a display electrode formed on a surface of one of said substrates and including an electrochromic substance film, said surface being in contact with said electrolyte; a first counter electrode formed on a counter surface of the other of said substrates, said counter surface being spaced from and facing said display electrode; a second counter electrode formed on a face of one of said two substrates, said face being in contact with said electrolyte; means for selectively applying a voltage between said display electrode and said first counter electrode to effect the coloration of said display electrode; means for selectively intermittently applying a voltage between said first counter electrode and said second counter electrode to effect removal of a minus ion layer which forms in the vicinity near said first counter electrode; and means for alternately changing the application of the voltage from between said display electrode and said first counter electrode to the application of the voltage between said first counter electrode and said second counter electrode.

4,349,819

SYSTEM FOR DRIVING A PLASMA DISPLAY PANEL DEVICE

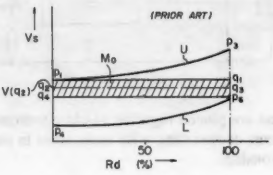
Toshiaki Terakawa, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1980, Ser. No. 135,181

Claims priority, application Japan, Mar. 29, 1979, 54-37398

Int. Cl.³ G09G *3/28*

U.S. Cl. 340—812 **6 Claims**



1. A system for driving a plasma display panel device, said device having dischargeable spots formed by cross points between X-directional electrodes and Y-directional electrodes, a drive circuit supplying discharge sustaining voltages and information writing-in voltages to said X-directional and Y-directional electrodes and a power source supplying power to said drive circuit, for increasing said discharge sustaining voltage with increasing the value of the discharge current through the discharging spots, said discharge current through the discharging spots corresponding to the current supplied to said drive circuit by said power source, said system comprising;

means for dropping in at least one step the voltage that is applied to said drive circuit from said power source, said dropping means comprising a respective stage for each said step,

means for detecting the current supplied to said drive circuit,

switching means for controllably shunting each said stage of said dropping means, responsive to the value of said detected current, so that said voltage that is applied to said drive circuit increases in stepwise fashion in correspondence to at least two predetermined different ranges of the ratio of the number of said discharging spots to the number of said dischargeable spots of said piasma display panel.

4,349,820

TONE SIGNAL DECODER

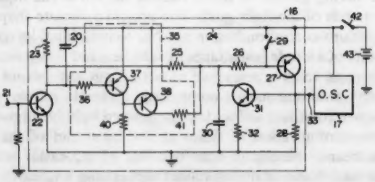
Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,938

Claims priority, application Japan, Aug. 25, 1979, 54-108396

Int. Cl.³ H04Q *1/44*; G08B *13/22*

U.S. Cl. 340—825.71 **5 Claims**



1. A tone signal decoder responsive to a predetermined tone signal, comprising: a power source, an input terminal to which a tone signal is applied, means comprising a charge and discharge circuit having a capacitor and connected to said input terminal for controlling charging and discharging of said ca-

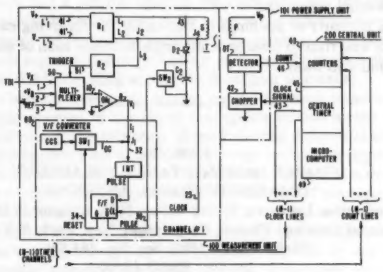
pacitor in response to said tone signal, means comprising a bypass circuit connected to said charge and discharge circuit for operating so that when said tone signal is not applied, said capacitor is placed in a respective one of the charge and discharge states corresponding to the absence of the tone signal within a time shorter than that required by said charge and discharge circuit, and a threshold circuit actuated when the capacitor terminal voltage reaches a threshold level because of said respective one of said charge and discharge states of said capacitor.

4,349,821

DATA ACQUISITION SYSTEM AND ANALOG TO DIGITAL CONVERTER THEREFOR

Gyorgy I. Vancsa, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1980, Ser. No. 116,053
Int. Cl.³ H04Q *5/00*
U.S. Cl. 340—870.21 **5 Claims**



1. In a multiplexed data acquisition system for deriving digital data with the assist of a digital computer in relation to a plurality of remote analog data measuring points with at least two analog input signals available at each of said measuring points, the combination of:

a like plurality of voltage-to-frequency (V/F) converters and respective multiplexers, each associated locally with a corresponding measuring point;

a central clock associated with said computer for providing a clock signal;

a like plurality of isolation transformers for providing communication and power, each between said computer and a corresponding one of said converters and associated multiplexer;

each of said V/F converters having a conversion cycle synchronized by said clock signal through said transformers;

said computer interrupting said clock signal to select with said multiplexers one of said two input signals at said measuring points to be passed to the associated V/F converter; and

said associated V/F converter outputting a train of pulses characterizing said passed one analog input signal, and said train of pulses being passed to said computer through the associated one of said transformers; and

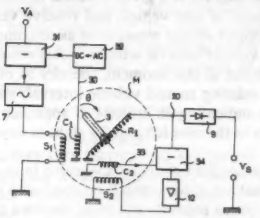
counter means associated with said computer for counting said pulses during a predetermined measurement time interval.

4,349,822

INDUCTIVE POTENTIOMETER

Jacques Decalonne, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 26, 1980, Ser. No. 134,337
Claims priority, application France, Mar. 28, 1979, 79 07802
Int. Cl.³ G08C *19/48*
U.S. Cl. 340—870.34 **9 Claims**



1. An inductive potentiometer to provide, from a d.c. supply voltage a d.c. output voltage following substantially a linear variation as a function of the rotation angle of a rotating spindle, comprising:

a rotating machine of the synchro-resolver type, having a rotary variable coupling between first and second windings respectively mounted on a stator and a winding on a rotor, the rotor being fixed to said rotating spindle; and

associated circuits including modulating means for converting said d.c. supply voltage into an a.c. voltage to supply the first stator winding, demodulating means for converting an a.c. voltage induced in said rotor winding into said d.c. output voltage; and

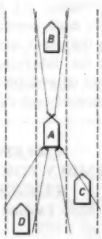
means for providing said linear variation including an amplifier circuit of determined gain G for applying said a.c. rotor induced voltage to the second stator winding to multiply the output voltage by a reducing factor which varies in inverse relation to the gain and rotation angle, to ensure said linear variation.

4,349,823

AUTOMOTIVE RADAR MONITOR SYSTEM

Katsutoshi Tagami, Asaka; Takaya Senzaki, Iruma; Nobuhiko Suzuki, Tokyo, and Eiji Murao, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1980, Ser. No. 171,165
Claims priority, application Japan, Jul. 24, 1979, 54-94106
Int. Cl.³ G01S *13/00*; G08B *23/00*; G08G *1/00*
U.S. Cl. 343—7 VM **4 Claims**



1. An automotive radar monitor system which comprises, in combination:

front monitor radar means for detecting a vehicle interval and relative velocity with an object in the front at any given moment;

rear-left and rear-right monitor radar means for detecting a

vehicle interval or intervals at any given moment with an object in the front, or an object or objects in the rear, left and/or right with respect to a vehicle in question provided with said system, respectively;

channel switching means for processing detection signals from said front and rear radar means in a time-division manner;

signal processing circuit means for obtaining an appropriate vehicle interval at a given moment in terms of the travelling speed of said vehicle and relative velocity with said front object at that moment so as to compare said appropriate vehicle interval with an actual vehicle interval with said object at that moment, thereby to output a warning signal relating to said vehicle interval, and for providing signals indicating an attitude of approach of an object or objects in the rear left and/or right at any given moment; and

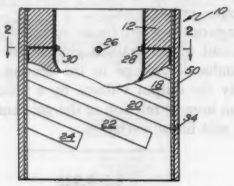
display means for indicating a warning in an integrally simulated fashion as to a vehicle interval with said front object at any given moment and as to the state of approach of a rear object or objects with respect to said vehicle in question at any given moment.

4,349,824

AROUND-A-MAST QUADRIFILAR MICROSTRIP ANTENNA

Eleanor S. Harris, Guilford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1980, Ser. No. 192,742
Int. Cl.³ H01Q *1/34, 1/36*
U.S. Cl. 343—700 MS **11 Claims**



1. An Around-A-Mast quadrifilar microstrip antenna for the periscope of a submarine which comprises:

a cylinder of a non-conductive material having metal plated at the top, bottom and inner surfaces thereof and forming a common ground plane from the top, bottom and inner surfaces;

a plurality of generally parallel conductive bands electrically isolated from said common ground plane on the outer surface of said cylinder;

connecting means for each member of said plurality of conductive bands on the outer surface of said cylinder; and

matching networks for delaying appropriately the outputs from each member of said plurality of conductive bands on the outer surface of said cylinder.

4,349,825

ANTENNA ASSEMBLY FOR HIGH FREQUENCY RANGES

Clarence F. Shmitka, 8554 Lurline Ave., Canoga Park, Calif. 91306

Filed Jun. 16, 1980, Ser. No. 160,086
Int. Cl.³ H01Q *9/00*
U.S. Cl. 343—750 **15 Claims**

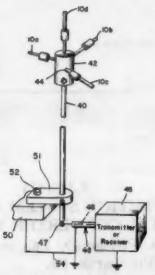
1. A multi-band antenna assembly being capable of being tuned separately for each of a plurality of different predetermined frequency ranges and comprising in combination:

a. a conventional single band tunable antenna including a mast, a conventional resonator fixedly mounted on said mast and a rod capable of telescoping into and out of said conventional resonator;

b. a multi-band adaptor including:

c. a collar capable of being slidable over said mast and being fixed to said mast;

d. a plurality of dielectric rods, each having a length corresponding to a predetermined frequency range;



e. an insulated wire wound helically about each of said rods to form a coil;

f. a tuning sleeve capable of sliding over each of said helically wound wires; and

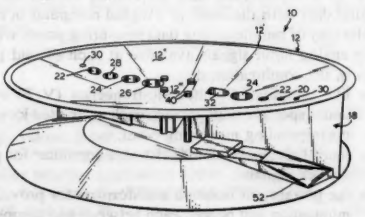
g. a plurality of openings in said collar for receiving each one of said rods to form an acute angle between each of said rods and said mast.

4,349,826

SIMPLE HORIZONTALLY POLARIZED OMNIDIRECTIONAL ANTENNA

Constantino Lucanera, Spring Valley, N.Y., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,576
Int. Cl.³ H01Q *13/00*
U.S. Cl. 343—773 **8 Claims**



1. An antenna capable of producing a horizontally polarized omnidirectional radiation pattern, comprising:

first and second substantially disc-shaped elements positioned co-axially and in opposing relation to one another;

an elongated connecting structure mounted between and attached to each of said substantially disc-shaped elements at their common axis,

a waveguide section within said connecting structure terminating in a pair of slots on opposite sides of said connecting structure;

a probe positioned symmetrically within said waveguide section, said probe and waveguide section arranged such that, in operation, an equal phase and amplitude distribution are produced at said slots; and

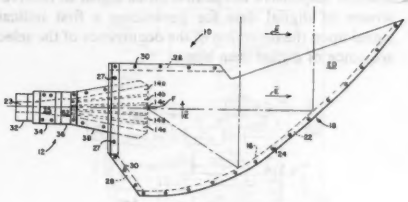
a co-axial supply means connected to said probe.

4,349,827

PARABOLIC ANTENNA WITH HORN FEED ARRAY

Stephen D. Bixler, Goleta; David T. Thomas, and Donald H. Archer, both of Santa Barbara, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 24, 1980, Ser. No. 209,934
Int. Cl.[3] H01Q 13/02
U.S. Cl. 343—786 2 Claims



1. A feed structure having a plurality of feed ports comprising:

(a) an input waveguide section means for supporting radio frequency energy having an electric field normal to opposing parallel sidewall portions of the input waveguide section means;

(b) a flared waveguide section means having diverging sidewalls and a narrow opening disposed adjacent the input waveguide section means for supporting radio frequency energy fed thereto by the input waveguide section means, such supported energy having an arcuately shaped electric field extending across the diverging sidewalls;

(c) a second waveguide section means disposed adjacent a wide opening of the flared waveguide section means for converting the arcuately shaped electric field of energy passing from the wide opening to the second waveguide section means into a linear electric field disposed normal to parallel opposing sidewalls of the second waveguide section means; and,

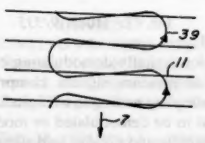
(d) a third waveguide section means disposed contiguous to the second waveguide section means and fed by energy passing thereto from such second waveguide section means with the linear electric field, such third waveguide section having a pair of opposing sidewalls and a plurality of spaced conductive members disposed between the pair of opposing walls to provide a plurality of channels between the second waveguide section means and the plurality of feed ports.

4,349,828

METHOD AND APPARATUS FOR OSCILLATING AN ARRAY OF MARKING ELEMENTS

Kenneth H. Fischbeck, Dallas; Marcus M. Schnarr, Lewisville, both of Tex., and Demetris F. Paraskevopoulos, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 4, 1980, Ser. No. 118,023
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—1.1 2 Claims



2. A method of moving an array of marking elements relative to a continuously moving mark-receiving surface, which comprises:

(a) moving a mark-receiving surface continuously in a first direction;

(b) oscillating an array of marking elements in a direction perpendicular to said first direction, such that the relative motion of said array over said mark-receiving surface forms a sine wave trace;

(c) modifying said sine wave trace to more closely define a rectangular grid trace by

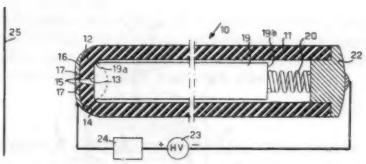
(d) oscillating said array in a direction parallel to said first direction in such manner that, when said array is at either extreme of its perpendicular direction oscillation, said array is moving in a direction parallel to but in the opposite direction as the direction of movement of said mark-receiving surface.

4,349,829

NON-IMPACT PRINTING METHOD

Michele Bovio, Brosso; Aquilino Barbero, Pavone; Walter Gillone, Ivrea, and Pierangelo Berruti, Chivasso, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 972,267, Dec. 22, 1978. This application Jul. 30, 1980, Ser. No. 173,822
Claims priority, application Italy, Dec. 28, 1977, 69927 A/77
The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—140 R 20 Claims



1. Non impact process for printing on a paper sheet comprising the steps of:

locating at least one electrically conductive solid block of ink in an insulating container having a nozzle;

locating said container with the nozzle directed toward and close to said paper; and

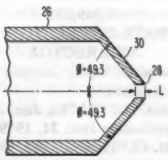
generating a potential difference between said block and the paper sufficient to break down the air dielectric along said nozzle and produce a corresponding electrical discharge onto said block to erode ink particles from said block and cause their transfer through said nozzle onto said paper.

4,349,830

CONICAL NOZZLE FOR AN ELECTROSTATIC INK JET PRINTER

Robert E. Rudd, III, Danbury, Conn., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 12, 1980, Ser. No. 206,012
Int. Cl.[3] G01D 15/18
U.S. Cl. 346—140 R 17 Claims



1. An electrostatic ink jet system comprising:

ink supply means for containing a supply of ink;

an ink jet nozzle mounted on said ink supply means, said ink jet nozzle including a fine pipe having a longitudinal channel for feeding said ink therethrough into a separately positioned piece of paper under control of an electric field, the end of said pipe nearest the paper having a conical configuration, the portion of said pipe adjacent to said conical configuration having a tubular configuration, an oriface passing through the tip of the conical configuration, the wall of said oriface being parallel with the axis of said longitudinal channel, the diameter of the longitudinal channel increasing between the tip of said conical configuration and the end of said tubular configuration adjacent to said conical configuration, the inner surface of said conical configuration forming an angle of approximately 49.3° with the axis of said longitudinal channel;

said piece of paper mounted on a conductive platen; and

wherein said electric field is applied between said platen and said ink jet nozzle.

4,349,831

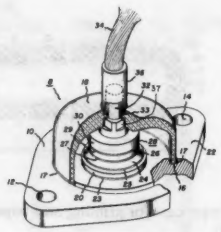
SEMICONDUCTOR DEVICE HAVING GLASS AND METAL PACKAGE

Jean P. Theroux, Marcellus, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,834

Int. Cl.³ H01L *23/02, 23/12, 23/30*

U.S. Cl. 357—74 **12 Claims**



1. A semiconductor device comprising:

a base member having a first surface;

a semiconductor subassembly attached to said first surface, said subassembly including a semiconductor element and first and second stress relief members bonded to first and second surfaces of said element respectively;

an electrode attached to said semiconductor subassembly, said electrode including a locking portion;

bell shaped glass cover means surrounding said semiconductor subassembly and having an opening for passing said electrode therethrough, said glass cover means including means for engaging said locking portion of said electrode; and

adhesive sealing means joining said glass cover means to said base member and to said electrode including said locking portion to form a hermetic enclosure containing said semiconductor subassembly.

4,349,832

DIGITAL DATA RATE CORRECTOR AND TIME BASE CORRECTOR

Luigi C. Gallo, Woodside, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 763,762, Jan. 28, 1977, Pat. No. 4,181,817. This application Dec. 31, 1979, Ser. No. 108,912

Int. Cl.³ H04N *5/785, 9/02*

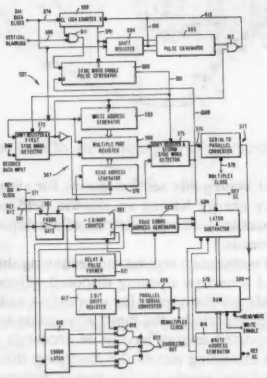
U.S. Cl. 358—8 **11 Claims**

9. A digital time base compensator for correcting timing errors in a stream of digital data, said digital data occurring at intervals and a rate that varies with timing errors and including a selected sequence of digital data bits that periodically occurs in the stream of digital data in phase with the digital data, comprising:

a first clock signal generator for generating a first clock signal at a variable rate in accordance with that of the digital data;

a second clock signal generator for generating a second clock signal at a reference rate;

a detector responsive to the first clock signal to receive the stream of digital data for generating a first indicating signal upon the detection of the occurrence of the selected sequence of digital data bits;



a digital data memory for temporarily storing the digital data at a time after the receipt of the digital data by the detector, said digital data memory responsive to one of said first and second clock signals for entering the digital data for storage at a rate determined by said one clock signal and responsive to the other of said first and second clock signals for retrieving the stored digital data at a rate determined by said other clock signal, said digital data memory further responsive to the first indicating signal for initially setting the relative times of entering and retrieving digital data.

4,349,833

APPARATUS FOR DIGITAL DEMODULATION OR MODULATION OF TELEVISION CHROMINANCE SIGNALS

Christopher K. P. Clarke, Crawley, England, assignor to British Broadcasting Corporation, London, England

Filed Sep. 8, 1980, Ser. No. 185,069

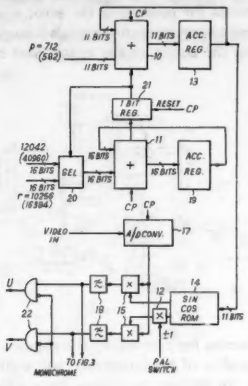
Claims priority, application United Kingdom, Sep. 12, 1979, 7931678

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—23 **8 Claims**

1. Apparatus for digitally demodulating or modulating colour television chrominance signals, comprising a source of clock pulses, a sampling analogue-to-digital converter responsive to the signal to be demodulated or modulated and to the clock pulses to sample and digitize said signal, a q-value memory storing an integral number q of sine-function values for generating a series of digital samples of a subcarrier signal having a predetermined period for the demodulation or modulation, a register for an address accessing the digital values

from the memory, and means responsive to the clock pulses to repeatedly add a value p to said address, the integers p and q



having a ratio p/q at least approximately equal to the ratio of the period of the clock pulses to the subcarrier period.

4,349,834

CHROMA SIGNAL GAIN CONTROL CIRCUIT

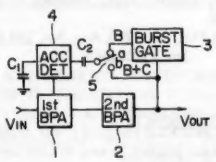
Kenichi Tonomura, Tachikawa; Kyoichi Takahashi, Kodaira, and Makoto Furihata, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,898

Claims priority, application Japan, Mar. 12, 1980, 55-30375

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—27 **10 Claims**



1. A chroma signal gain control circuit comprising: a first band pass amplifier having a variable gain function; a second band pass amplifier connected to receive at its input the amplified output of the first band pass amplifier; a burst gate circuit connected to receive at its input the amplified output of the second band pass amplifier; switch circuit means for selectively transmitting either the output of said burst gate circuit or the output of the second band pass amplifier to the output thereof; and an ACC detecting circuit connected to receive the output of said switch circuit means for generating a gain control signal which is applied in control of said first band pass amplifier.

4,349,835

COLOR PRINTING PROCESS SIMULATOR

Satoru Horiguchi, Saitama; Takeshi Sasaoka, and Koichi Shimane, both of Kawasaki, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,904

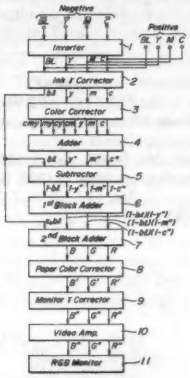
Claims priority, application Japan, Mar. 4, 1980, 55-27150

Int. Cl.³ H04N *9/02*

U.S. Cl. 358—76 **10 Claims**

1. A method for reproducing a color image on a screen of a color monitor for simulating a color printing process comprising

a step of processing primary color signals, which are obtained by scanning a set of color separation films formed from a color original to be simulated, on the basis of color reproduction equations of halftone representing three additive



primary colors to derive secondary color signals and a tertiary color signal; and

a step of adjusting amplitudes of a signal expressing paper color, the primary color signals, the secondary color signals, the tertiary color signal and the primary color signal of black in this order independently from each other.

4,349,836

APPARATUS FOR DISPLAYING INFORMATION

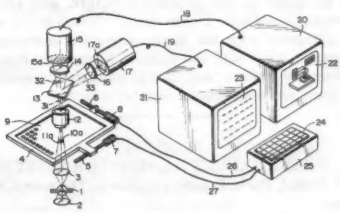
Yukio Sawano, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 641,493, Dec. 17, 1975, abandoned. This application Nov. 29, 1977, Ser. No. 855,626

Claims priority, application Japan, Dec. 19, 1974, 49-146089

Int. Cl.³ G03B *23/08, 21/00;* **H04N** *7/18*

U.S. Cl. 358—93 **2 Claims**



1. An apparatus for displaying a plurality of kinds of related information simultaneously comprising:

a plurality of superposed information carrying media having different kinds of visible information related to each other recorded separately thereon in different colors to be detected independently of each other,

illuminating means provided on one side of the information carrying media for illuminating said media,

a plurality of image pick up tubes provided on the other side of the media,

projecting means disposed between the media and the pick up tubes for projecting superposed images of the information carried by the media simultaneously onto all the image pick up tubes, said projecting means comprises a single projection lens and an image separating means

disposed between the projection lens and the plurality of image pick up tubes for separating light from the projection lens and projecting images separately on the tubes,

a color separating means provided between the projecting means and the respective image pick up tubes for separately projecting the images of different color onto the image pick up tubes, and

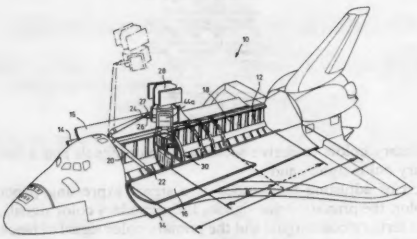
a plurality of display devices connected with the image pick up tubes respectively for simultaneously displaying said plurality of kinds of related information.

4,349,837

SATELLITE SERVICING

Charles M. Hinds, Weston, Canada, assignor to Spar Aerospace Limited, Weston, Canada

Division of Ser. No. 54,829, Jul. 3, 1979, Pat. No. 4,273,305.
This application May 6, 1980, Ser. No. 147,208
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—93 **5 Claims**



1. In a remote manipulator system in which a television camera is mounted at a free end of a manipulator arm to relay a target image to a monitor having image alignment markings thereon, the manipulator arm having an end effector located at the free end thereof for use in mounting and releasing a complementary component with respect to a support structure, the improvement of;

(a) a target mounted at a site remote from said complementary component in a direct line of vision of said camera when said end effector is axially aligned with said complementary component and said complementary component is mounted on said support structure, said target being proportioned such that its image viewed at the monitor is coextensive with the image alignment markings of said monitor when said end effector is operably positioned to mount or release said complementary component with respect to its associated support structure.

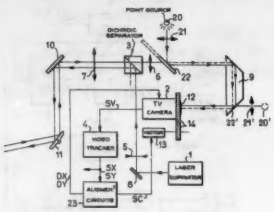
4,349,838

LASER TARGET DESIGNATOR SYSTEM

Jean P. Daniel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 28, 1981, Ser. No. 229,261
Claims priority, application France, Feb. 1, 1980, 80 02250
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—125 **6 Claims**

1. A laser target designator system comprising: a laser illuminator; an electronically swept video image sensor; video tracking means with a tracker processing on the basis of the video signal the error signals at X and Y of the designated target; a system of optical components defining the respective transmission and reception paths, certain of these optical components being developed for orienting the laser beam and for receiving, in the same direction, the radiation of the external scene included in the sighting field of the sensor; a sensor rotation device; and an alignment device for making the laser beam axis coincide with that of the sighting field leading to the centre of the swept image on the sensor, said device comprising a point light source, an optical system for focusing the radiation of the source on the sensor via a mirror interposed on the reception path and which interrupts the reception of the radiation of the scene towards the sensor during the alignment phase, and electronic means for processing the error signals at X and Y and producing sweep correction signals intended for the sensor for displacing the centre of the image, said electronic means



comprising means for controlling the rotation device for producing a plurality of predetermined successive angular positions, means for storing successive error data on the image point of the source and means for calculating on the basis of the stored data errors of the invariable point of the image corresponding to the sensor rotation axis, said errors defining the sweep correction signals at X and Y to be applied to the sensor.

4,349,839

VERTICAL SYNC COUNTER HAVING MULTI MODES OF OPERATION FOR DIFFERENT TV SYSTEMS STANDARDS

Michael McGinn, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1980, Ser. No. 220,610
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—148 **19 Claims**

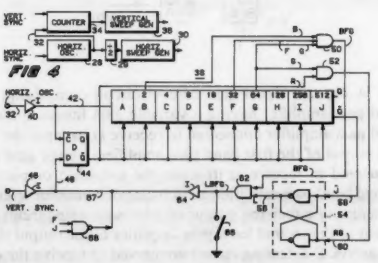


FIG 4

1. A vertical counter for a TV receiver having a horizontal oscillator for providing horizontal sync pulses which are coupled to at least said counter to be counted thereby:

said counter adapted to provide output pulses to a vertical sweep generator,

said counter adapted to receive a vertical sync pulse to synchronize said counter,

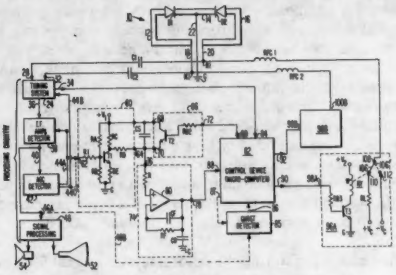
said counter having a first mode of operation wherein said counter counts up to a first predetermined number of said horizontal pulses at which time said counter is automatically reset and at least a second mode of operation wherein said counter counts up to a second predetermined number of said horizontal pulses at which time said counter is automatically reset.

4,349,840

APPARATUS FOR AUTOMATICALLY STEERING AN ELECTRICALLY STEERABLE TELEVISION ANTENNA

John G. N. Henderson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,248
Int. Cl.³ H04N 5/44
U.S. Cl. 358—188 21 Claims



1. In a receiver having a tuning system for selecting a channel frequency to be received, apparatus comprising:

a loop antenna;

switch means cooperating with said loop antenna responsive to an electrical control signal for producing a plurality of reception pattern conditions of said loop antenna;

comparison means for determining the amplitude of signals received from said loop antenna with each said reception pattern condition and for automatically determining when said reception pattern condition produces said received signal of a predetermined amplitude condition; and

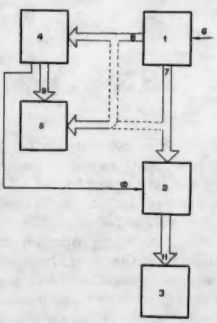
control means responsive to said comparison means for applying said electrical control signal to said switch means to establish said loop antenna in the reception pattern condition for said predetermined amplitude condition.

4,349,841

METHOD AND SYSTEM FOR INCREASING THE NUMBER OF INSTRUCTIONS TRANSMITTED IN DIGITAL SYSTEMS, I.A. IN SYSTEMS FOR REMOTE CONTROL OF TELEVISION RECEIVERS

Franciszek Marciniak, Warsaw, Poland, assignor to Zaklady Telewizyjne Unitrapolkolor Osrodek Badawczo-Rozwojwy Techniki Telewizyjnej, Warsaw, Poland

Filed Dec. 28, 1979, Ser. No. 108,077
Claims priority, application Poland, Dec. 30, 1978, 212382
Int. Cl.³ H04N 5/44
U.S. Cl. 358—194.1 5 Claims



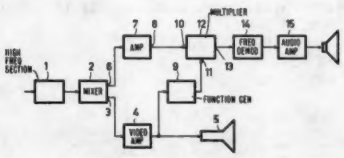
1. A method of increasing the number of instructions transmitted in remote control systems of television receivers and the like in which decoded signals directly control receiving units, comprising transmitting coded instructions in a command signal (6), decoding said instructions into a first part of an instruction signal (8), processing said first part of the instruction signal (8) in a strobing signal generation circuit (4) to provide a first signal (10) in a form for enabling the transmission of a control signal (7) through a register (2) in the form of a stored signal (11) to first receiving units (3) to be controlled while simultaneously providing a second signal (9) in a form for blocking the reception of one of said instruction signal (8) and said control signal (7) by additional receiving units (5) to be controlled, transmitting an additional coded instruction in said command signal, decoding said additional instruction into a second part of the instruction signal (8), processing said second part of the instruction signal (8) in said strobing signal generation circuit (4) to provide said first signal (10) in a form for blocking further storage of said control signal (7) in said register (2) while simultaneously providing said second signal (9) in a form for enabling the reception of said one of said instruction signal (8) and said control signal (7) by said additional receiving units (5) to be controlled, and transmitting a coded erasing instruction in said command signal for restarting the method.

4,349,842

TELEVISION RECEIVER FOR RECEIVING A PICTURE CARRIER WHOSE AMPLITUDE IS MODULATED WITH A VIDEO SIGNAL, AND A SOUND CARRIER WHOSE FREQUENCY IS MODULATED WITH AN AUDIO SIGNAL

Hans J. Apeldoorn, and Miloslav Tryzna, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1980, Ser. No. 197,449
Claims priority, application Netherlands, Nov. 9, 1979, 7908216
Int. Cl.³ H04N 5/62
U.S. Cl. 358—197 5 Claims

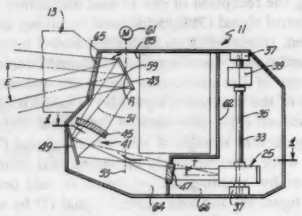


1. A television receiver for receiving a picture carrier whose amplitude is modulated with a video signal, and a sound carrier whose frequency is modulated with an audio signal comprising: a mixing circuit for generating the demodulated video signal and an amplitude-modulated sound intercarrier signal, a frequency demodulator for generating the demodulated audio signal, and a multiplying-dividing circuit for dividing said sound intercarrier signal by the amplitude modulation signal detected at an output terminal of said mixing circuit and for applying a sound intercarrier signal with a substantially constant amplitude to said frequency demodulator.

4,349,843
TELEVISION COMPATIBLE THERMAL IMAGING SYSTEM

Katherine D. Laakmann, and Peter Laakmann, both of Laguna Niguel, Calif., assignors to Flir Systems, Inc., Lake Oswego, Oreg.

Filed Jun. 26, 1978, Ser. No. 919,133
Int. Cl.³ H04N *3/08, 5/33*
U.S. Cl. 358—206 **28 Claims**

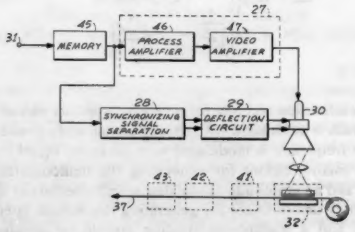


1. A radiometer system comprising:
detector means for providing an output signal related to a characteristic of thermal energy applied thereto;
first and second optical scanners;
said first scanner including first means for scanning a field of view in a first direction and providing at least some of the thermal energy received from the field of view to the second scanner;
said second scanner including second means for scanning at least some of the thermal energy received from the first means in a second direction and providing at least some of such thermal energy to said detector means, said directions being non-parallel;
means for defining an image plane in the optical path between said first and second means; and
means for providing at least one point blackbody adjacent the image plane whereby the blackbody can be scanned by said second means.

4,349,844
CIRCUIT FOR MAKING A CRT DISPLAY A TV PICTURE FOR A COPY WITH DOTS SUPERPOSED ON HALF-TONE PICTURE AREAS

Akiyoshi Kouno; Masanobu Morishita, and Yoshio Yui, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 844,982, Oct. 25, 1977, Pat. No. 4,205,340. This application Sep. 4, 1979, Ser. No. 72,417
Claims priority, application Japan, Oct. 27, 1976, 51-129903; Oct. 28, 1976, 51-130219
Int. Cl.³ H04N *5/84, 1/40*
U.S. Cl. 358—244 **7 Claims**

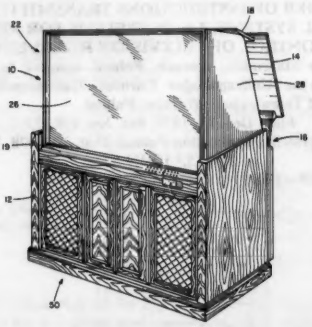


1. Apparatus to form a monochrome copy on a copying medium, said copy being a copy of a picture displayed on a monochrome television receiving cathode-ray tube along a plurality of horizontal scanning lines in each raster in response to a cathode-ray tube input signal, said apparatus including said monochrome television receiving cathode-ray tube and a circuit which is responsive to a color television signal for producing said cathode-ray tube input signal, said color television signal comprising vertical synchronizing signals at a field period equal to a half of a picture frame period, horizontal synchronizing signals between two adjacent ones of said vertical synchronizing signals, at a horizontal scanning period, luminance components interposed between two adjacent ones of said horizontal synchronizing signals and having signal levels available between a first and a second level, and color subcarrier signals carrying chrominance components and superposed on the luminance components of the signal levels between said first and said second levels, each horizontal scanning line being superposed on a horizontal scanning line displayed on said cathode-ray tube a frame period earlier to form a horizontal scanning line pair, said subcarrier signals having a subcarrier frequency equal to a half of an odd integral multiple of the horizontal scanning frequency and being in phase-opposition in each horizontal scanning line pair, said circuit comprising:
first means for storing the color television signal for a period preselected to be equal to a selected one of said field and said frame periods;
reading means for repeatedly reading the stored color television signal to produce a succession of block signals each of which lasts during said selected period and in which the subcarrier signals are in-phase in each horizontal scanning line pair; and
second means for delivering said block signal succession to said cathode-ray tube as said cathode-ray tube input signal.

4,349,845
CONTROL PANEL COVER FOR PROJECTION TELEVISION RECEIVER

Paul Strauss, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 30, 1981, Ser. No. 259,333
Int. Cl.³ H04N *5/64*
U.S. Cl. 358—254 **1 Claim**



1. A control panel cover assembly for use in an ultra-compact, jack-in-the-box rear-projection television receiver housed in an open-topped cabinet having lid means pivotally attached at the back thereof for selectively opening and closing said cabinet for emergence and storage of an elevatable unitary optical assembly including rear projection screen means for displaying a television image upon said emergence, said unitary optical assembly including rigid, box-like shroud means for supporting said viewing screen on the front thereof, said receiver including widthwise-oriented control panel means located inwardly adjacent to the top section of a front panel of said receiver, said control panel cover assembly comprising:

an outwardly swinging control panel cover member for covering said control panel, said cover member being attached to said lid means at the front thereof by at least one inwardly-spring-biased hinge means;

front panel means having recess means adjacent to said control panel means for receiving said control panel cover member;

such that as said unitary optical assembly means is elevated from said cabinet, said lid means is urged upwardly, raising said control panel cover member from said recess and uncovering said control panel, said hinge means providing for the outward swinging of said cover member effective to cause said member to ride up and outwardly on said shroud means as said shroud emerges, and such that when said unitary optical assembly is lowered into said cabinet control panel, said lid means is lowered and said cover member swings downwardly and inwardly for re-entering said recess means and covering said control panel.

4,349,846

PICTURE PROCESSING METHOD

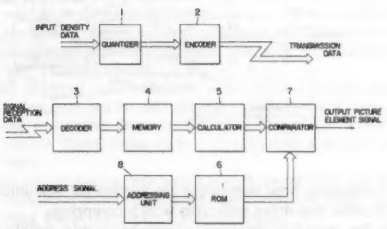
Keiji Sekigawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,395

Claims priority, application Japan, Apr. 17, 1979, 54-47071; Apr. 17, 1979, 54-47072; Apr. 17, 1979, 54-47073; Jun. 2, 1979, 54-69041

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **4 Claims**



1. A picture processing method of restoring a picture including half tone with binary outputs, in which said picture comprises a plurality of picture element units which are sampled in order to provide density levels of said picture elements forming said picture;

said density levels of said picture elements are coded and transmitted to a signal receiving side;

on said signal receiving side, an estimation density level of an aimed picture element is calculated in accordance with a particular equation including a modulation factor and weight factors provided for each of said picture elements in a particular picture element region constituted by said aimed picture element and picture elements surrounding said aimed picture element, by using the density level of said aimed picture element and those of said surrounding picture elements; and

said estimation density level is compared with a threshold, corresponding to said aimed picture element, in a threshold pattern preset, so that the level of said aimed picture element is determined as black or white as a result of said comparison.

4,349,847

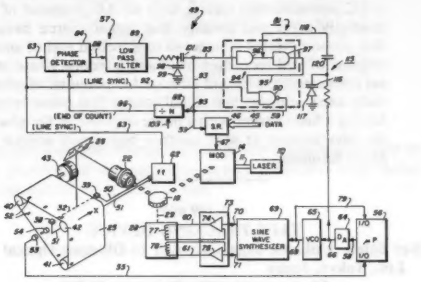
IMAGE SIZE CONTROL FOR RASTER SCANNERS

James C. Traino, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1981, Ser. No. 229,811

Int. Cl.³ H04N *1/12*

U.S. Cl. 358—293 **9 Claims**



1. In a raster output scanner for producing images on a movable imaging member in response to image pixels input thereto, said scanner including a high intensity imaging beam, a movable scanning element for scanning said beam across said imaging member, a drive motor for driving said scanning element, modulator means for modulating said beam to selectively expose said imaging member in accordance with image pixels input thereto, and clock means for generating pixel clock pulses for clocking image pixels to said modulator means, the combination comprising:

(a) sensor means for producing a pulse-like signal representative of the velocity of said imaging member; and

(b) control means responsive to said signal for adjusting the speed of said drive motor to change the velocity of said scanning element to thereby maintain a predetermined velocity relationship between said imaging member and said scanning element in spite of changes in the velocity of said imaging member during operation of said scanner.

4,349,848

RECORDING CIRCUIT

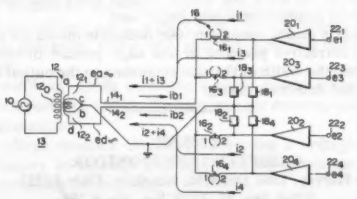
Shoichi Ishii, Warabi; Taiken Hagiwara, Yokosuka, and Masanobu Shimanuki, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 11, 1979, Ser. No. 74,762

Claims priority, application Japan, Sep. 18, 1978, 53-114435; Jun. 15, 1979, 54-75388

Int. Cl.³ G11B *5/47, 5/02*

U.S. Cl. 360—66 **120 Claims**



1. A recording circuit comprising:

a multi-channel recording head each channel receiving, at one end, a recording signal;

a plurality of impedance means for bypassing a bias current, each of said impedance means being connected to a first end of a respective channel and a circuit with an AC potential of substantially zero each of said impedance

means having a smaller impedance at the bias current frequency than at the recording signal frequency;

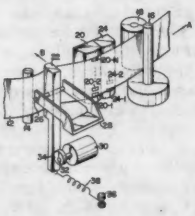
a bias oscillator, including an even number of bias signal sources for providing bias currents with the same frequencies to the respective channels of said recording head, including one bias signal source having a first phase terminal connected to a second end of one channel of said recording head and a second phase terminal connected to a AC potential-zero circuit with an AC potential of substantially zero, and another bias signal source having a first phase terminal connected to a second end of another channel of said recording head and a second phase terminal connected to a circuit with an AC potential of substantially zero, said one bias signal source first phase terminal having a bias current with a phase opposite to the phase of the bias current at said another bias signal source first phase terminal.

4,349,849

TAPE TRACKING DEVICE

Ken Satoh, Akikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,598
Claims priority, application Japan, Jun. 26, 1979, 54/80331
Int. Cl.³ G06K *13/00*; B65H *23/02*; G11B *15/18*
U.S. Cl. 360—71 **9 Claims**



1. A device for tracking a tape during a reproduce mode of a tape recorder, comprising:

first and second position detecting reproducing heads disposed across the width of a tape such that said position detecting heads are in an overlapped relation to that area of the tape where a signal is recorded and such that said position detecting heads suffer a different amount of shift with respect to said area of the tape when the tape is displaced in a direction of the width of the tape, said position detecting heads providing respective output signals which are a function of the amount of overlap of said heads with respect to said area of said tape;

detection means coupled to said position detecting heads for producing an output signal corresponding to a difference in level between the output signals from said first and second position detecting heads; and

correction means coupled to said detection means for applying corrective pressure to one edge portion of the tape across the width of the tape according to the output signal of said detection means.

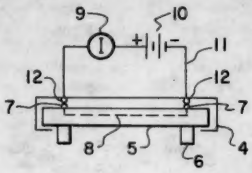
4,349,850

CASSETTE TAPE MONITOR

William Harvey, 1300 Daleside, Hinckley, Ohio 44233

Filed Jan. 25, 1979, Ser. No. 6,288
Int. Cl.³ G11B *15/48*
U.S. Cl. 360—74.2 **2 Claims**

1. An improved tape player and recorder of the type having spindles adapted to receive tape on reels or cassettes, wherein said improvement consists of a power supply, at least one contact rotating on a said spindle and at least one stationary contact carried on said player and recorder, a light and an electrical circuit comprising said contacts, said light and said power supply, said circuit, causing said light to turn on when said contacts close said circuit and to turn off when said



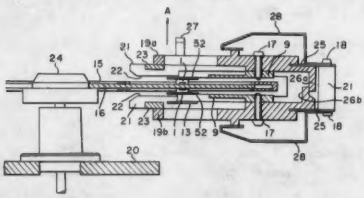
contacts open said circuit, responsive to motion of said spindles.

4,349,851

MAGNETIC HEAD SUPPORTING MECHANISM FOR A MAGNETIC DISC APPARATUS

Noboru Higashiyama, and Masaru Sasaki, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,818
Claims priority, application Japan, Jul. 10, 1979, 54-87301
Int. Cl.³ G11B *21/16, 21/22, 5/54*
U.S. Cl. 360—105 **3 Claims**



1. A magnetic head supporting mechanism for a double side type flexible disc drive apparatus which comprises:

means for rotatably driving an interchangeable double side type flexible disc;

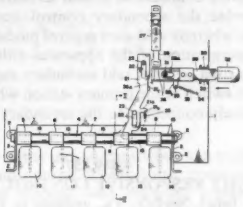
first and second magnetic heads for read-out or write-in on each magnetic recording surface respectively of said double side type flexible disc; and said magnetic heads being slidably contacted with said magnetic recording surface during the operation for the read-out or write-in;

a carriage driven by means for positioning said first and second magnetic heads on a predetermined data track of said double side type flexible disc; and said carriage comprising first and second frame elements mounting first and second arms, means for rotating at least one of said first and second arms out of read-out/write-in position and first and second magnetic head assemblies respectively mounted on said first and second arms; wherein one of said magnetic head assemblies comprises one of said magnetic heads; a resilient holder consisting of a part fixed to said arm and a part for supporting to said magnetic head; a gimbal spring disposed on said supporting part of said holder and having a surface fixed to said head and a projection formed on the back surface opposite to the surface fitting said magnetic head; and a point member fixed on said holder at one end and contacting said projection at the other end.

4,349,852
SOUND-DUBBING MECHANISM FOR A VIDEO TAPE RECORDER

Tsutomu Kawai, Yokosuka, Japan, assignor to Funai Electric Co., Ltd., Osaka and Efuti Giken Co., Kanagawa, both of, Japan

Filed May 8, 1980, Ser. No. 148,004
Int. Cl.³ G11B *15/18*
U.S. Cl. 360—137 **9 Claims**



1. In a videotape recorder of the type wherein circuit means is provided for playing back audio signals recorded on a magnetic tape when in a first condition and for recording audio signals on said magnetic tape when in a second condition and manually operated controls are provided for operation of the videotape recorder and circuit means in a playback mode, a recording mode and for stopping the operation of the recorder, the improvement comprising a sound dubbing mechanism which includes:

manually operated playback lever control means movable between a first inoperative position and an operative second position for operation in said playback mode;

manually operated dubbing control means movable between an inoperative first position and a second position for said dubbing;

said dubbing control means including switch means connected in said circuit means having a first condition for normal operation of said circuit in said playback mode when said manually operated playback lever means is in said second position;

said dubbing control means when in said second position being engaged by said playback lever control means during movement from first to second position to shift said switch means from its first condition to a second condition;

said circuit means, when said switch means is in said second condition being operated in said recording mode for dubbing audio signals on a magnetic tape;

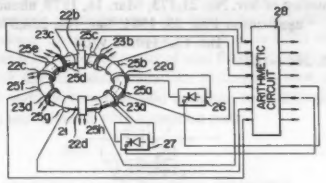
said dubbing control means being responsive to movement of said playback lever control means from its second position to its first position to return said dubbing control means to its first position.

4,349,853
STRONG MAGNETIC FIELD GENERATOR AND METHOD OF OPERATING THE SAME

Yoshihisa Sato, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 7, 1980, Ser. No. 119,622
Claims priority, application Japan, Feb. 13, 1979, 54-14206
Int. Cl.³ H02H *7/00*
U.S. Cl. 361—19 **5 Claims**

1. A strong magnetic field generator comprising a vacuum vessel, a plurality of superconductive coils wound on the outer periphery of said vacuum vessel, a plurality or protective coils wound on said outer periphery of said vacuum vessel similar to said superconductive coils, a control means functioning, upon occurrence of quenching in at least one of said superconductive coils, to quickly reduce current in said superconductive coil or coils with quenching taking place so as to remove the quenching while at the same time causing current corresponding to the reduction of current in said superconductive coil or coils with quenching therein to flow through said protective

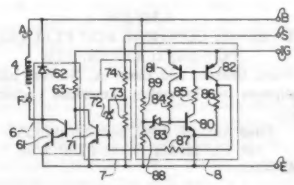


coils, and a current source for selectively supplying current to said plurality of superconductive and protective coils under the control of the control means.

4,349,854
POWER GENERATION CONTROL SYSTEM FOR VEHICLE GENERATOR

Kazumasa Mori, Aichi; Taro Asahi, Chiryu; Kelichiro Banzai, Toyota; Katsutaro Iwaki, Chiryu; Katsuya Muto, Kariya; Akira Mase, Handa; Takayasu Nimura, Nagoya; Katsumi Itoh, Ohbu, and Yoshio Akita, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 19, 1980, Ser. No. 151,156
Claims priority, application Japan, May 25, 1979, 54-65325
Int. Cl.³ H02J *7/24*
U.S. Cl. 361—21 **5 Claims**



1. A power generation control system in combination with a vehicle generator including an armature coil, an exciting coil and a rectifier for converting an a.c. voltage produced from the armature coil into a d.c. current, and a vehicle battery charged by said generator, said power generation control system comprising:

a switching circuit including a single power transistor for controlling a current flowing into the exciting coil of said generator;

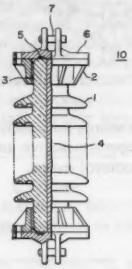
a voltage detector circuit for detecting a voltage of said battery to activate said single power transistor of said switching circuit; and

an overvoltage detecting means for deactivating said single power transistor of said switching circuit controlled by said voltage detector circuit, which in turn cuts off the current of said exciting coil independently of the operation of said voltage detector circuit when the voltage of said battery exceeds a predetermined value, said overvoltage detecting means including a transistor circuit for holding the deactivation of said switching circuit.

4,349,855
LIGHTNING ARRESTER

Nobuo Nagai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 21,173, Mar. 16, 1979, abandoned. This application Feb. 25, 1981, Ser. No. 238,074
Int. Cl.³ H02H 9/04
U.S. Cl. 361—127 3 Claims

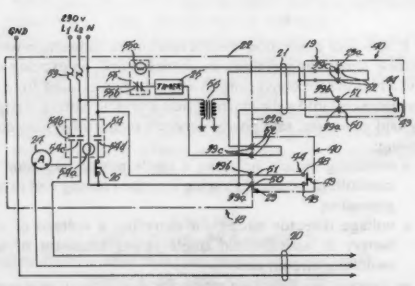


1. A lightning arrester including a sintered non-linear resistor and an insulator formed into a unitary body, comprising:
a non-linear resistor composed of a composition having zinc-oxide as a main component and sintered at approximately 1300° C.; and
an insulator having a predetermined inner volume and substantially surrounding said non-linear resistor, said insulator composed of a sintered porcelain covering said non-linear resistor and sintered at approximately 1160° C. to 1200° C., said sintering causing a contraction of said porcelain only, which eliminates any gap between said insulator and said non-linear resistor thereof,
whereby only the contraction of said insulator during the sintering thereof need be adjusted for in determining said perdetermined inner volume.

4,349,856
SAFETY START CONTROL FOR ELECTRICALLY POWERED APPARATUS

Frank L. West, Sharon, and Larry A. Norton, Elkhorn, both, Wis., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,202
Int. Cl.³ H01H 33/00; F16P 3/04
U.S. Cl. 361—160 6 Claims

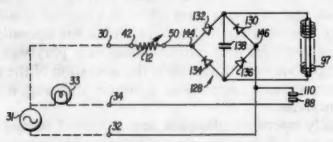


1. In a system for controlling energization of electrically powered apparatus, in combination:
a primary control station remote from said apparatus from which energization of the apparatus is usually controlled;
a secondary control station which is immediately adjacent said apparatus so as to be conveniently accessible to a person servicing the apparatus, and from which energization of said apparatus may be optionally controlled, said secondary control station having no start switch and being adapted to receive a manual start switch;
and a single manually portable apparatus start control module which is usually operatively connected to said primary control station, said start control module having a manually operable start switch and being manually removable from said primary control station to leave the primary control station without a start switch, and being manually operatively connectable to said secondary control station to provide the secondary control station with a start switch, whereby said start control module may be used to start energization of the apparatus either from said primary station or from said secondary station, and there is no start switch at the primary station when said module is operatively connected to the secondary station.

4,349,857
LIGHT RESPONSIVE CONTROL DEVICE

Michael A. Tabet, Norfolk, Va., assignor to Tabet Manufacturing Company, Norfolk, Va.

Filed Feb. 3, 1978, Ser. No. 874,759
Int. Cl.³ H01H 47/24
U.S. Cl. 361—173 7 Claims



1. A light responsive control switch for controlling a load in response to a predetermined amount of light incident thereon, comprising:
a light sensitive element for receiving said incident light,
an electromagnet having a longitudinal axis, said electromagnet including a coil coaxial with said longitudinal axis and electrically coupled to said light sensitive element, said electromagnet having an aperture therein extending along said longitudinal axis,
an armature composed of a magnetic material positioned adjacent said electromagnet, said armature being translatable along said longitudinal axis upon energization of said electromagnet;
a non-magnetic guide pin secured to said armature, said guide pin extending into said aperture,
contact means positioned adjacent said armature, said armature making electrical contact with said contact means when said electromagnet is deenergized, and
means for coupling said contact means and said armature to said load.

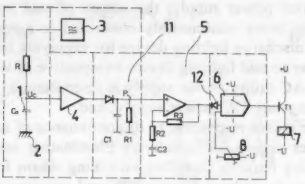
4,349,858
CONTROL CIRCUIT FOR USE WITH AN ELECTRONIC GUARD STRIP

Pekka Torenius, Korpi, and Seppo Suur-Askola, Hyvinkää, both of Finland, assignors to Elevator GmbH, Baar, Switzerland

Filed Sep. 4, 1980, Ser. No. 184,072
Int. Cl.³ G08B 13/26
U.S. Cl. 361—181 4 Claims

1. An improved control circuit for use with an electronic guard strip to prevent collision of the strip with a moving object, said control circuit having a control means and comprising at least one antenna forming a capacitor together with a base in its ambiance, a voltage generator for conducting an alternating voltage to said antenna, a first amplifier means in circuit relation with said control means and said antenna, whereby a change of voltage arising from any capacitive perturbation in said antenna is conducted to said control means,

the improvement comprising: rectifier means and a second amplifier means, said rectifier means connected to said amplifier means and to said second amplifier means in sequence, said second amplifier means acting as an a.c. amplifier, having its direct current gain as +1, but which amplifies any change of



voltage occurring in the d.c. voltage input to a multiple, comparator means, said control means being connected to said comparator means through said amplifier means, and said control means being responsive to an action threshold value of said comparator means in respect of output voltage of said second amplifier means.

4,349,859

SHIELDED STRUCTURAL OR CONTAINMENT MEMBER

Laurence R. Sanders, St. Charles County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sep. 24, 1980, Ser. No. 190,458
Int. Cl.³ B64D *45/02*
U.S. Cl. 361—218 **12 Claims**

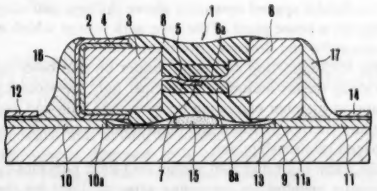
1. In an aircraft, a structural or containment member that is exposed to the atmosphere at the exterior of the aircraft, said member comprising a base adapted to carry substantially all of any forces exerted on the member and being formed from a composite material that is a relatively poor conductor of electricity, the composite material including nonmetallic fibers and a resin matrix in which the fibers are embedded; and a thin metal shield adhered to and extended over that surface of the base that is presented outwardly with respect to the aircraft, the thin metal shield being exposed to the atmosphere at the exterior of the aircraft for dissipating an electrical charge that attaches to the member, the metal of the shield being tin or a tin alloy.

4,349,860

TANTALUM CONDENSER

Mitsuo Ohsawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,424
Claims priority, application Japan, Apr. 13, 1979, 54/45610
Int. Cl.³ H01G *1/14*
U.S. Cl. 361—310 **1 Claim**



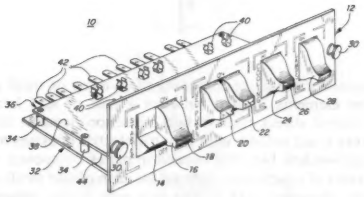
1. A tantalum capacitor comprising:
(A) a first cylindrical metallic terminal cap;
(B) a tantalum capacitor element electrically and mechanically connected to said metallic terminal cap;
(C) a second solid cylindrical metallic terminal aligned with said first metallic terminal cap and selected from the group of copper or brass;
(D) a tantalum lead projecting from one end surface of said tantalum capacitor element toward said second metallic terminal; and
(E) a projection formed as one piece with one end surface of said second metallic terminal which is welded to said tantalum lead, wherein a part of said first metallic terminal cap, and said tantalum capacitor element, a part of said second metallic terminal, said tantalum lead and said projection are covered with synthetic resin.

4,349,861

AUTOMOBILE CONTROL MODULE

John M. Zizza, 16 Lawson Ave., Revere, Mass. 02151

Filed Jun. 30, 1980, Ser. No. 164,171
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—347 **10 Claims**



1. An automobile control module comprising:
a switch panel including ignition switch means, starter switch means, fuel switch means, and cooling switch means; and
a circuit board mounted with said switch panel and having high-current foil conductors including a power bus foil having means for receiving a power cable;
a fuel bus foil interconnected with said power bus foil through a first set of contacts in said ingnition switch means;
fuel output contact means, fuel fuse means interconnected between said fuel output contact means and said fuel switch means for connection through said fuel switch means to said fuel bus foil in one position of said fuel switch means;
an ignition bus foil; ignition fuse means interconnecting said ignition bus foil with said power bus foil; ignition output bus foil means including ignition output contact means, said ignition switch having a second set of contacts interconnecting said ignition bus foil with said ignition output bus boil means;
a starter bus foil, said starter switch means interconnecting said starter bus foil with said ignition bus foil;
a cooling input bus foil, cooling fuse means interconnected between said power bus foil and said cooling input bus foil, cooling output bus foil means, including cooling output contact means, said cooling switch means interconnecting said cooling input bus foil with said cooling output bus foil means.

4,349,862

CAPACITIVE CHIP CARRIER AND MULTILAYER CERAMIC CAPACITORS

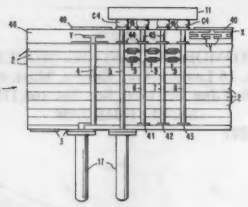
Christopher H. Bajorek, Goldens Bridge, N.Y.; Dudley A. Chance, Danbury, Conn., and Chung W. Ho, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,949
Int. Cl.³ H05K *1/16*
U.S. Cl. 361—401 **12 Claims**

1. In a carrier for electronic circuit chips in which a chip is

carried on conductor pads on a first external surface of said carrier which provides mechanical support means and electrical connections through said mechanical support means for said chip, said carrier including a lower surface opposing said first external surface,

said carrier including a plurality of laminated ceramic sheets with metallized conductive vias extending therethrough from said pads to said lower surface for providing electrical contact through said carrier to said chip and to terminals on said lower surface, the improvement comprising,



a capacitor structure consisting of an array of small capacitor elements located between a pair of said laminated ceramic sheets, each of said capacitor elements having a very small volume with a high dielectric constant material sandwiched between capacitor plates composed of two layers of conductive material for each of said small capacitor elements, said conductive vias being interspersed within said capacitor structure and isolated from said capacitor plates, with means providing electrical connections to said vias for providing electrical connections of said capacitive elements for external connections through an external surface to said chip and said terminals.

4,349,863

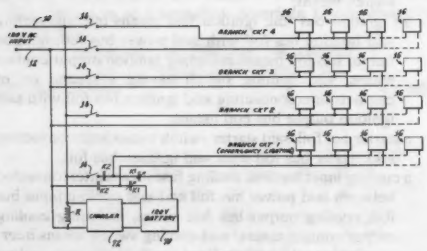
EMERGENCY LIGHTING SYSTEM

Warren A. Petersen, Ridgefield, Conn., assignor to Tork, Inc., Mount Vernon, N.Y.

Filed Apr. 21, 1980, Ser. No. 141,819

Int. Cl.³ F21V *19/04*; H02H *7/00*

U.S. Cl. 362—20 **5 Claims**



1. An emergency lighting system in which selected ones of the lighting fixtures used for providing normal illumination from an AC utility power supply available at their inputs, can likewise be used to furnish illumination from an emergency DC power supply available at the same inputs, said DC power supply being operatively connected to said lighting fixtures under emergency conditions when said AC utility power supply is discontinued, comprising:

a plurality of branch circuits, each having a plurality of lighting fixtures connected therein;

an AC utility power supply normally connected by said branch circuits to said inputs on said lighting fixtures;

a selected branch circuit being provided with emergency lighting fixtures, each of said emergency lighting fixtures comprising an electron discharge lighting device, a high frequency inverter power supply, and a rectifier;

each inverter power supply and each rectifier having an input and an output; the input of said rectifier being continuously connected to said selected branch circuit; the output of said rectifier being continuously connected to the input of said inverter power supply; the output of said inverter power supply being continuously connected to a respective electron discharge lighting device for supplying high frequency power to said lighting device irrespective of whether or not said AC utility power supply is discontinued;

an emergency DC power supply; and,

transfer means responsive to discontinuance of said AC utility power supply for selectively illuminating said emergency lighting fixtures, including switching means for connecting said selected branch circuit to said emergency DC power supply.

4,349,864

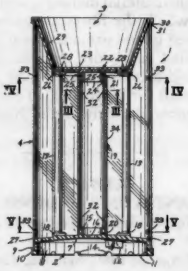
LIGHTED PLANT STAND

Phillip H. Smith, 7511 Harold Ave., Minneapolis, Minn. 55427

Continuation of Ser. No. 21,432, Mar. 19, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 238,155

Int. Cl.³ F21P *1/02*

U.S. Cl. 362—122 **34 Claims**



1. A lighted plant stand for houseplants, comprising:

a base;

a plant holder spaced upwardly above the base and adapted to support a house plant of the type with foliage which extends outwardly and downwardly therefrom;

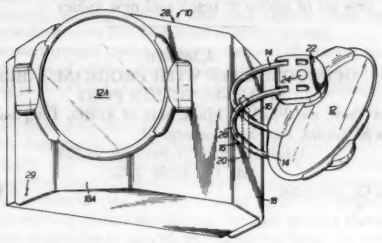
means for supporting said plant holder on said base, said supporting means including a vertical light pervious cylinder support member extending between said base and said plant holder thereby holding said plant holder and base in vertical spaced relationship; and

an electrical light disposed within said light pervious cylinder support member for providing growing light for the plant foliage and for backlighting such foliage from within the space below said plant holder, said electric light being spaced radially inwardly from said cylinder support member to provide an air space therebetween, said cylinder support member preventing said foliage from contacting the hot surface of said electric light.

4,349,865
LAMP MOUNTING

Christopher Terrel, London, England, assignor to Chloride Group Public Limited Company, London, England

Filed Jul. 2, 1980, Ser. No. 165,409
Claims priority, application United Kingdom, Apr. 3, 1980, 8011389
Int. Cl.³ F21V 21/14
U.S. Cl. 362—250 13 Claims



1. An adjustable mounting assembly for at least one lamp comprising:

a support body having an external face and at least one slot formed in said external face;

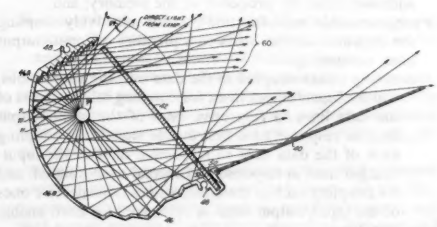
at least one arcuate member upon which the lamp is mounted; and

fastener means operatably associated with said support body for retaining said at least one arcuate member against opposite end portions of said at least one slot to permit the at least one arcuate member to move longitudinally in relation to the ends of the at least one slot to adjust the lamp angularly.

4,349,866
LIGHT REFLECTION SYSTEM WITH ASYMMETRIC REFLECTOR ASSEMBLY

John P. Molnar, St. Louis, Mo., assignor to General Signal Corporation, Stamford, Conn.

Filed May 27, 1980, Ser. No. 153,519
Int. Cl.³ F21V 7/00
U.S. Cl. 362—263 6 Claims



1. A light reflection system adapted to be mounted on the wall of a room for providing essentially uniform indirect lighting for the room comprising:

a housing having front and rear walls, a bottom wall, and side walls, and having an extended opening at its top;

a light source disposed in a horizontal orientation, said source being parallel to the rear wall of said housing and closer to the rear wall than to the front wall;

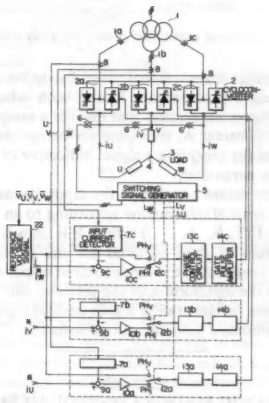
an asymetric distribution means in the form of a reflector assembly enclosed by the housing, said assembly including a main reflector wrapped substantially around said light source, said reflector extending longitudinally approximately 250° around said light source from approximately a twelve o'clock position to approximately a four o'clock position, as seen at the left side of said housing when mounted;

said main reflector having a reflecting, corrugated, inner surface comprising a series of at least six contiguous facets located adjacent said twelve o'clock position, said facets having appropriately selected varied angles so as to reflect light rays in a generally horizontal direction thereby to provide uniform distribution of light.

4,349,867
CONTROL APPARATUS FOR A CYCLOCONVERTER

Kenichi Otsuka, Kodaira; Hiroshi Uchino, Hachioji, and Kihei Nakajima, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1981, Ser. No. 241,100
Claims priority, application Japan, Mar. 26, 1980, 55-38649
Int. Cl.³ H02M 5/257
U.S. Cl. 363—160 6 Claims



1. A control apparatus for a cycloconverter which is connected to a multiphase AC power source and includes m sets of bridge converters each of which has a first output terminal connected to a common connection point and a second output terminal connected to a corresponding input terminal of a m-phase load ($m \geqq 3$) disconnected from said common connection point, and is comprised of silicon controlled rectifier (SCR) elements, said control apparatus comprising:

voltage control means for controlling the output voltages of said bridge converters in accordance with a predetermined reference voltage signal;

current control means for controlling the output voltages from said bridge converters in accordance with a phase control input signal dependent on a difference between a reference current signal to determine the output currents from said bridge converters and the load currents of said load; and

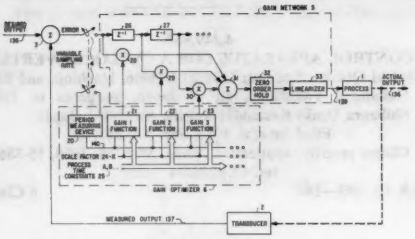
switching means for periodically switching said voltage control means and said current control means in accordance with a phase of the load voltage;

wherein said voltage control means controls by said reference voltage signal the output voltage of the bridge converter corresponding to a load voltage during a 1/m period of one cycle of said load voltage, the center of said 1/m period being located at a positive or negative maximum amplitude point of said load voltage, and said current control means controls by said phase control input signal the output voltage of said bridge converter during the remaining $(1-1/m)$ period of said one cycle of said load voltage.

4,349,868
SAMPLED CONTROL LOOP WITH DYNAMIC GAIN OPTIMIZATION

Troy L. Brown, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 23, 1980, Ser. No. 162,221
Int. Cl.³ G05B *13/02, 21/02*
U.S. Cl. 364—157 **22 Claims**



A SAMPLED CONTROL LOOP OPTIMIZED FOR *m* GAIN FUNCTIONS

1. An optimizer for a sampled control loop for controlling a process having a process gain K and with which there are associated process parameters that include a sampling interval T and a time constant A, the optimizer comprising:

input means for receiving a signal indicative of the value of a process parameter;

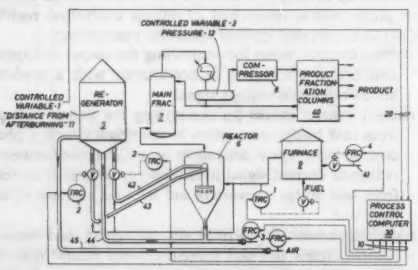
optimization means coupled to the input means for producing gain control information according to an optimization function F(T, K, A, . . .) where F is chosen to minimize the amount of time required for the process to settle within a preselected tolerance band in response to a disturbance in the equilibrium of the process; and

output means for generating a gain control signal indicative of the optimized gain control information.

4,349,869
DYNAMIC MATRIX CONTROL METHOD

David M. Prett; Brian L. Ramaker, both of Houston, and Charles R. Cutler, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 1, 1979, Ser. No. 80,966
Int. Cl.³ G06F *15/46;* **G05B** *13/04*
U.S. Cl. 364—159 **8 Claims**



1. A method of controlling and optimizing the operation of a process having a plurality of independently controlled, manipulated variables and at least one controlled variable dependent on said manipulated variables, said method comprising the steps of:

introducing test disturbances in said manipulated variables and measuring the effect of the disturbances on said controlled variable;

calculating at discrete intervals of time from said introducing and measuring the magnitude of response of said controlled variable to a given change in one of said manipulated variables;

measuring the present values of said manipulated variables and said controlled variable;

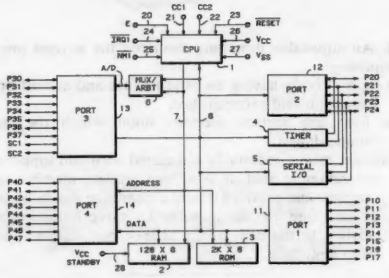
using said calculated magnitude of response to calculate for discrete intervals of time a new set of moves for said manipulated variables for obtaining new values and for moving said controlled variable toward its optimum setpoint; and

adjusting said manipulated variables in accordance with said new set of moves to reach said new values.

4,349,870
MICROCOMPUTER WITH PROGRAMMABLE MULTI-FUNCTION PORT

Pern Shaw, and Fuad H. Musa, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1979, Ser. No. 72,739
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **6 Claims**



1. In a microcomputer comprising:

a processor;

a memory for storing data at selected addresses;

a bidirectional data bus comprising a plurality of data lines coupled to the processor and to the memory, for transferring data between the processor and the memory; and

an address bus comprising a plurality of address lines coupled to the processor and to the memory, for transferring addresses from the processor to the memory; and

a programmable multi-function port for selectively coupling the data and address buses to a plurality of input/output lines, comprising:

coupling means coupled to the data bus, the address bus, and the input/output lines, for coupling selected ones of the data lines to respective ones of the input/output lines in response to a first enable signal, for coupling each of the data lines to respective ones of the input-/output lines in response to a second enable signal, and for coupling each of the address lines to respective ones of the input/output lines in response to a third enable signal; and

mode control means coupled to the coupling means, for selectively providing the first, second and third enable signals.

4,349,871
DUPLICATE TAG STORE FOR CACHED MULTIPROCESSOR SYSTEM

Richard F. Lary, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 28, 1980, Ser. No. 116,151
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. A multiprocessor system comprising:

A. main memory means **(18)** including a plurality of address-

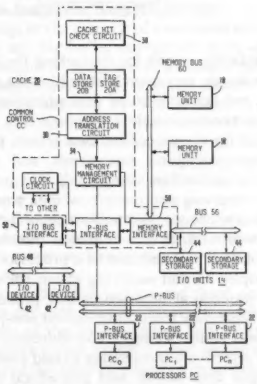
able storage locations for storing data and for generating address, data and memory control signals;

B. A plurality of processor units (22) for processing data in response to instructions and for generating signals including address, data, and writing control signals for initiating transactions that access addressable storage locations in said main memory means;

C. common control means shared by said processor units and said main memory means, said common control means including

i. receiving means (24) for receiving said address, memory control, writing control, and data signals from said processor units and said main memory means,

ii. write-through cache memory means (20) including a plurality of addressable storage locations each having a tag portion (20A) for storing a tag address that identifies a certain location in said main memory means and a corresponding data portion (20B) for storing a copy of the data stored in that location of said main memory means, said cache memory means further including updating means connected to said receiving means and responsive to said writing control signal for forgoing the writing of data signals into the data portion thereof and responsive to said memory control signal for writing the data portion of said cache memory means corresponding to an address in the main memory means;



iii. transmitting means (38) connected to said receiving means for transmitting said address, writing control, and data signals to said main memory means;

D. processor bus means (P-Bus) interconnecting said processor units and said common control means for transferring said address, writing control and data signals associated with the transactions among said processor units and said common control means;

E. memory bus means (60) interconnecting said common control means and said main memory means for transferring said address, writing control, memory control, and data signals associated with the transactions between said common control means and said memory means; and

F. said common control means further including:

ii. first queing means (70) interposed between said transmitting means and said memory bus means for receiving said address, writing control and data signals and for subsequently transmitting said signals to said memory bus means;

iii. duplicate tag storage means (86) connected to said cache memory means for maintaining copies of the tag address information stored in the tag portion of said cache memory means; and

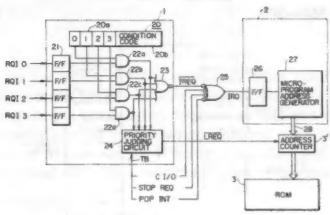
iv. second queing means (80) connected to said duplicate tag storage means and being interposed between said memory bus means and said receiving means for receiving on a first-in-first out basis said address, memory control and data signals from said main memory means, said second queing means being operative to subsequently transmit to said receiving means said address, memory control, and data signals when said address signal matches an address contained in said duplicate tag storage means thereby to enable said updating means to write the data portion of said cache memory means.

4,349,872

INTERRUPT CONTROL SYSTEM

Sigeru Fukasawa, Hachiouji, and Sadao Mizokawa, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 5, 1980, Ser. No. 127,318
Claims priority, application Japan, Mar. 16, 1979, 54-30015
Int. Cl.³ G06F 9/46
U.S. Cl. 364—200 **4 Claims**



1. A data processing system under microinstruction control comprising:

memory means for storing microinstruction sequences including an interrupt processing sequence comprising a first routine and a plurality of second routines, said first routine sequentially specifying polling of each of a plurality of first interrupt requests and each of a plurality of second interrupt requests in a predetermined order, and said second routines each specifying a processing of a respective one of said first and second interrupt requests;

a plurality of first means each for generating one of said first interrupt requests;

a plurality of second means each for generating one of said second interrupt requests;

executing means provided on an integrated circuit chip including receiving means for receiving said second interrupt requests in parallel from said second means, status register means for manifesting mask bits, and gate means including a plurality of gates each connected to said receiving means and said status register means for masking one of said received second interrupt requests in response to a corresponding one of said mask bits;

OR gate means for providing a single interrupt request signal in response to any of said first interrupt requests provided by said first means and in response to any of said masked interrupt requests provided by said gate means;

control means formed on an integrated circuit chip for providing an initial address of said first routine to said memory means in response to said single interrupt request signal in order to initiate said first routine thereby; and

means connected to said gate means and said first means for generating a jump signal and applying said jump signal to said memory means during the polling of said first and second interrupt requests by said first routine when a specified interrupt request is provided thereto, said jump signal ordering said memory means to jump to the one of said second routines corresponding to the specified interrupt request;

wherein said OR gate means comprises first and second OR gate means, said first OR gate means being provided outside of said integrated circuit chip on which said exe-

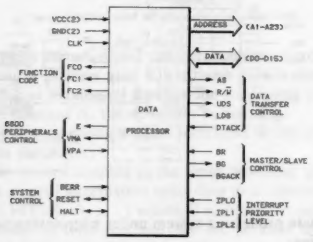
cuting means is provided and outside of said integrated circuit chip on which said control means is provided, said second OR gate means being provided within the same integrated circuit chip as said executing means, said first OR gate means being responsive to any of said generated first interrupt requests, said second OR gate means being responsive to any of said masked second interrupt requests, and said first and second OR gate means being mutually connected so that each of the outputs thereof is provided to said control means as said single interrupt request signal via a common signal line.

4,349,873

MICROPROCESSOR INTERRUPT PROCESSING

Thomas G. Gunter; John E. Zolnowsky, and Lester M. Crudele, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1980, Ser. No. 136,593
Int. Cl.[3] G06F *9/46*
U.S. Cl. 364—200 **4 Claims**



1. In a data processor for executing operations upon digital information in response to a plurality of instruction programs, an interrupt circuit comprising:

first means adapted for coupling to first and second types of circuitry external to the data processor, for receiving interrupt signals from both the first and second types of external circuitry representing requests to interrupt the execution of an instruction program currently being executed by the data processor in order to execute another of the plurality of instruction programs;

second means adapted for coupling to the first type of the external circuitry, for receiving from the first type of external circuitry a vector number indicative of a vector address within a predetermined portion of the address space of the data processor which contains an address vector comprising an address within one of the plurality of instruction programs;

third means coupled to the first means and having an output adapted for coupling to the first and second types of external circuitry, for providing, in response to the interrupt signal, a granting signal to the first and second types of external circuitry indicating that the interrupt request has been granted by the data processor;

fourth means having an input adapted for coupling to the first type of external circuitry, for receiving a first acknowledgement signal provided by the first type of external circuitry indicating that a vector number has been provided to the second means, and for latching, in response to the first acknowledgement signal, the vector number received by the second means;

fifth means having an input adapted for coupling to the second type of external circuitry, for receiving a second acknowledgement signal provided by the second type of external circuitry indicating that a vector number has not been provided to the second means, and for providing, in response to the second acknowledgement signal, a predetermined vector number independent of any vector number received by the second means; and

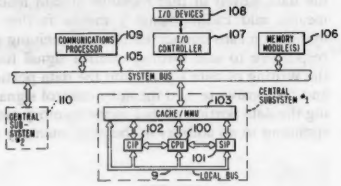
sixth means coupled to the fourth and fifth means, for generating the vector address indicated by the vector number provided by the fifth means is so provided and the vector address indicated by the vector number latched by the fourth means otherwise.

4,349,874

BUFFER SYSTEM FOR SUPPLY PROCEDURE WORDS TO A CENTRAL PROCESSOR UNIT

William E. Woods, Natick; Philip E. Stanley, Westboro; David E. Cushing, Chelmsford, and Richard A. Lemay, Carlisle, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 15, 1980, Ser. No. 140,630
Int. Cl.[3] G06F *3/00, 13/00*
U.S. Cl. 364—200 **11 Claims**



1. An interfacing system for controlling the transfer of procedural data words, procedural data addresses, non-procedural data words, and non-procedural data addresses from a system memory to a processor unit in response to a request by the processor unit for the procedural data words, procedural data addresses, non-procedural data words, and non-procedural data addressed said system comprising:

means for receiving said procedural data words, said procedural data addresses, said non-procedural data words, and said non-procedural data addresses transferred from said system memory in response to a processor request;

means coupled to said receiving means for storing said received procedural data words and procedural data addresses separately from said received non-procedural data words and non-procedural data addresses; and

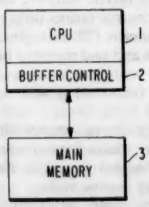
means for selectively transferring to said processor unit said procedural data words, said procedural data addresses, said non-procedural data words, or said non-procedural data address stored in said storing means.

4,349,875

BUFFER STORAGE CONTROL APPARATUS

Masahiro Tada, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,968
Claims priority, application Japan, May 25, 1979, 54-65445
Int. Cl.[3] G06F *7/34;* G11C *7/00;* G06F *7/00*
U.S. Cl. 364—200 **3 Claims**



1. A buffer storage control apparatus disposed between a central processing unit (CTU) and a main memory unit

(MMU) or between an MMU and at least one input/output (I/O) storage unit, said control apparatus including a buffer storage unit for storing a portion of the contents of the MMU when disposed between the CPU and the MMU or a portion of the contents of said at least one I/O storage unit when disposed between MMU and said at least one I/O storage unit, and a control unit for controlling said buffer storage unit, said control unit comprising:

an address register for storing a given address having first, second and third portions and related to the MMU or said at least one I/O storage unit;

a directory memory for storing the second portion of the given address;

a plurality of address comparators, each comparing the first portion of the given address and the address register with the portions of the given address stored in said directory memory;

means responsive to the first and second portions of the given address in the address register for performing a read operation for reading a data block out of the buffer storage unit with the occurrence of a match in one of said comparators;

a replacement-block detecting circuit for detecting the read operation for specific data in said data block stored in the buffer storage unit;

a selector for selecting a selected address for a subsequent replacement of a data block, the selected address indicating the data block in which the read operation for said specific data was detected by the detecting circuit;

means for writing, in the absence of a match in any one of said comparators, into the buffer storage unit at an address location that is designated by (i) said first and second portions of the given address and (ii) the selected address of the data block previously selected by said selector, a data block stored in the corresponding address of the MMU or said at least one I/O storage unit which pairs with the buffer storage unit;

means for storing (**18**) the selected address;

a selector memory (**20**);

a selector control circuit (**19**) receiving the selected address, said selector control circuit comprising a plurality of exclusive OR logic means each receiving a bit from the means for storing (**18**); and

a detecting circuit (**1920**) receiving the third portion of the given address for detecting the last data word in the data block read out of the buffer storage and for providing an inverting control signal (**2010**) to the exclusive OR logic means, whereby the selector control circuit (**19**) delivers (i) the selected address to the selector memory (**20**) when the inverting control signal is at a first logic state, and (ii) the selected address with the bits thereof inverted when the inverting control signal is at a second logic state opposite said first logic state.

4,349,876

CONTROL ARRANGEMENT FOR IMPROVING THE DRIVING STABILITY OF MOTOR VEHICLES WHICH ARE EQUIPPED WITH ANTI-SKID BRAKE SYSTEMS

Klaus Lindemann, Hanover, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

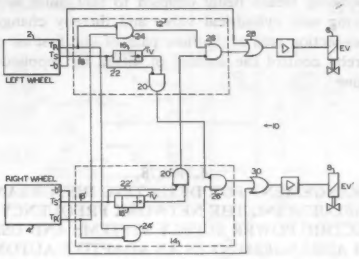
Filed Nov. 7, 1979, Ser. No. 92,015

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855326

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **14 Claims**

1. A switching circuit arrangement for improving the stability of travel during the braking of a vehicle equipped with an anti-skid brake system on a roadway having different coefficients of friction on the left and right side of the vehicle comprising, sensing devices for sensing the rotational behavior of the vehicle wheels, control circuits associated with the wheels for evaluating the rotational behavior of the wheels and for obtaining deceleration, acceleration, and slip control signals which control the condition of solenoid supply valves for regulating the brake pressure on the wheels so that the braking pressure is applied in pulsating fashion to a wheel running with a higher coefficient of friction, and at least two interrelated operating circuits electrically interconnected between said control circuits and said solenoid supply valves, said interrelated operating circuits including timing means for controlling the braking



pressure on the wheel running with the higher coefficient of friction so that the brake pressure is held constant for a period of time and then is increased in response to the control signals of said control circuit of the wheel running with the lower coefficient of friction which is being controlled and at times when the wheel with the lower coefficient of friction is being braked.

4,349,877

ELECTRONICALLY CONTROLLED CARBURETOR

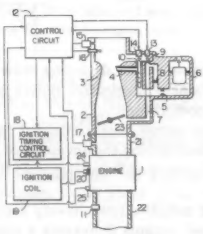
Yoshishige Oyama, Katsuta, and Hiroshi Kuroiwa, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,490

Claims priority, application Japan, Apr. 5, 1979, 54-41733

Int. Cl.³ F02M *7/18, 7/24;* **G06F** *15/20*

U.S. Cl. 364—431.05 **4 Claims**



1. An electronically controlled carburetor system for controlling the air-fuel mixture supplied by a carburetor to an internal combustion engine comprising:

sensor means for sensing prescribed characteristics of selected physical parameters related to the operation of the engine;

control means for controlling at least one of the amount of intake air and the amount of fuel supplied to the engine; and

processing means, responsive to output signals produced by said sensor means representative of said prescribed characteristics, for generating an output signal representative of a change in the density of the air taken into the engine, said output signal being coupled to said control means whereby said at least one of the amount of intake air and the amount of fuel supplied to the engine is controlled in accordance with said change in air density; and wherein

said carburetor comprises a venturi portion containing a primary intake passage and a secondary intake passage and wherein said control means comprises an air density adjusting section disposed in said venturi portion and separating

said primary intake passage from said secondary intake passage and including a first air path which couples said primary intake passage with said secondary intake passage, a second air path which communicates with said first air path and opens to the upstream side of said venturi portion, and a cylindrical valve which is slidably moveable within said second air path by a pulse motor, the output signal from said processing means being coupled to said pulse motor for moving said cylindrical valve and thereby changing the cross-section area of the flow path of said first air path, to thereby control the amount of intake air supplied to the engine.

4,349,878

ARRANGEMENT FOR DETECTING DISTURBANCES INFLUENCING THE NETWORK FREQUENCY IN ELECTRIC POWER SUPPLY SYSTEMS AND USE OF SUCH ARRANGEMENT IN AN ADAPTIVE AUTOMATIC FREQUENCY CONTROL SYSTEM FOR AN ELECTRIC POWER SUPPLY SYSTEM

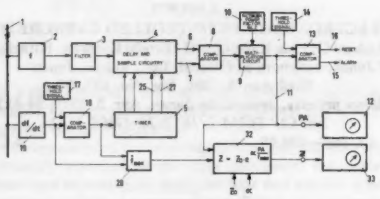
German Grimm, Anton-Günther-Strasse 7, 8060 Dachau, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,550

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854315

Int. Cl.³ G01R *23/00*

U.S. Cl. 364—484 **8 Claims**



3. An arrangement for detecting network frequency influencing disturbances in electric power supply systems, said arrangement comprising:

first measuring circuit means coupled to said power supply system for ascertaining the deviation of the frequency of said system from a desired frequency, said first measuring circuit comprising:

a delay and sample circuit having a plurality of outputs, a first of said outputs delivering a signal representing the system frequency immediately prior the appearance of the disturbance, a second of said outputs delivering a signal representing the system frequency shortly after the appearance of the disturbance;

second measuring circuit means coupled to said power supply system for ascertaining the rate of frequency change;

a timer connected to said first and second measuring circuitry, said timer providing a plurality of clock signals for controlling said delay and sample circuit;

a comparator adapted to receive said first and second output signals from said delay and sample circuit and to provide an output signal;

means for multiplying the output of said comparator by a network power factor proportional to the magnitude of the disturbing power per unit of frequency deviation, said network power factor being selected for the specific power supply system being monitored; and

a first indicator couple to the output of said multiplying means to provide an indication of the value of the disturbing power which causes the frequency disturbance.

4,349,879

APPARATUS FOR CONTROLLING ELECTRICAL POWER CONSUMPTION

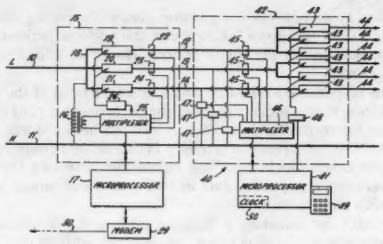
Robert A. Peddie, Reigate, and John S. Fielden, Ottery St. Mary, both of England, assignors to South Eastern Electricity Board, England

Filed Feb. 13, 1980, Ser. No. 121,203

Claims priority, application United Kingdom, Feb. 21, 1979, 7906213

Int. Cl.³ G06F *15/56*

U.S. Cl. 364—492 **16 Claims**



1. Apparatus for controlling electrical power consumption by a load of a consumer drawing power from a power supply network, said apparatus comprising current control means for controlling the flow of current to the load from the power supply network, means for sensing the magnitude of the current supplied to the load from the power supply network, a controller responsive to the sensed current and arranged to set the current limit means so as to limit the sensed current to a magnitude not exceeding a predetermined value, and means for remotely applying to the controller information defining the predetermined value.

4,349,880

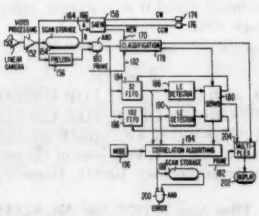
INSPECTION SYSTEM FOR DETECTING DEFECTS IN REGULAR PATTERNS

Peter D. Southgate, Princeton, and John P. Beltz, Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 21,826, Mar. 19, 1979, abandoned. This application Jun. 30, 1980, Ser. No. 164,348

Int. Cl.³ G06F *15/20, 15/336*

U.S. Cl. 364—507 **10 Claims**



1. An inspection system for detecting defects in regular patterns wherein the elements of the patterns have variations in spatial period, said system comprising

means for scanning and detecting the elements of a pattern, means for processing an output signal from said means for scanning and detecting during scanning, said means for processing including means for quantizing the output signal from the scanning and detecting means into binary digital signals, main storage means for storing the quantized signal of a portion of a scan, means for determining element period from the quantized signal and for control-

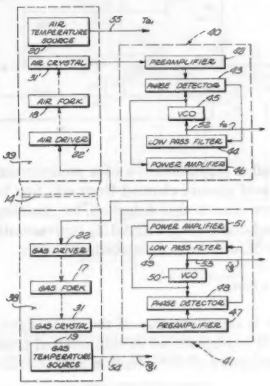
ling the output of said main storage means at times related to element period, means for correlating the output from said main storing means with a real time quantized signal of the same scan, and means for indicating the presence of an error related to a pattern defect in response to a miscorrelation signal from said correlating means.

4,349,881

VIBRATION INSTRUMENTS

Milton H. November, Hacienda Heights; LaVern D. Lyon, Claremont, and Joseph J. Ponzi, Alhambra, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,709
Int. Cl.³ G01F *1/00*
U.S. Cl. 364—509 **17 Claims**



1. A vibration instrument comprising: a base; a housing sealed to said base to define a first space; vibratable tuning fork means in said first space including two substantially parallel legs connected at one pair of mutually adjacent ends by a bight portion, said tuning fork means having a variable frequency of vibration f; a longitudinal magnetostrictive member having first and second opposite ends on an axis fixed relative to said base and said bight portion, respectively, said parallel legs extending in a direction from said bight portion away from the said second end of said member in positions approximately symmetrical about said axis; a piezoelectric crystal fixed relative to said bight portion to produce an output signal of said frequency f equal to the said vibrational frequency of said tuning fork means; first driver means including a first driver coil mounted around said member, said first driver means also including an amplifier connected from said crystal to impress a signal upon said first driver coil of the same said frequency f to cause said tuning fork means to vibrate at said frequency f, said first driver means having an output at which an output signal is produced, said output signal having said frequency f; and first computer means connected to receive said crystal output signal for producing an output signal directly proportional to the first expression:

$$\frac{A_g}{f_g^2} - B_g$$

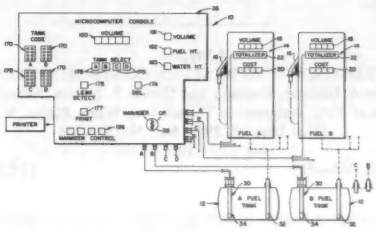
where $f_g = f$, and A_g and B_g are constants, said constants A_g and B_g having first and second sources, respectively, to provide first and second signals, respectively, to said first computer means directly proportional to said constants A_g and B_g, respectively, and where the said first expression is directly proportional to the density of a fluid in which said vibratable tuning form means is immersed.

4,349,882

LIQUID LEVEL MEASURING SYSTEM

Einar Asmundsson, Middle Haddam; Robert P. Hart, Glastonbury, and Donald W. Fleischer, Wethersfield, all of Conn., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Aug. 22, 1980, Ser. No. 181,083
Int. Cl.³ G01F *23/26*
U.S. Cl. 364—509 **21 Claims**



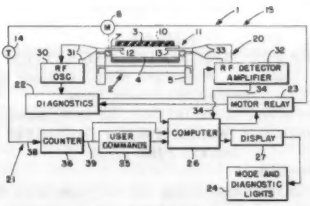
1. In a method of measuring the height of a liquid with an elongated capacitance probe mounted to extend through the surface of the liquid and having a succession of a plurality of longitudinally tending capacitor sections, each havinf a separately measurable capacitance value considered to vary with the liquid height between predetermined dry minimum and submerged maximum capacitance values thereof stored in a computing system, the method comprising the steps of electronically measuring the capacitance value of each of the plurality of capacitor sections with the computing system, calculating with the computing system the height of the liquid from the measured capacitance value of one capacitor section at the surface of the liquid and from its respective predetermined minimum and maximum capacitance values stored in the computing system, and at least when said one section is higher than the lowest section, storing in the computing system the measured capacitance value of a capacitor section lower than said one capacitor section as an updated predetermined maximum capacitance value for that lower section.

4,349,883

SIGNAL DETECTOR CIRCUIT WITH GAIN CONTROL METHOD

Frank A. Doljack, Pleasanton, Calif., assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,218
Int. Cl.³ G08B *21/00*; G06F *15/46*
U.S. Cl. 364—551 **40 Claims**



1. A monitoring apparatus for monitoring the occurrence of a plurality of events in a cyclical process, comprising event transducer means for detecting the occurrence of such events in such process, said event transducer means comprising means for producing an input signal which may vary in an unknown manner upon the occurrence of each event, a signal control apparatus including output means for producing an output signal, changing means for receiving such input signal and

causing said output means to produce such output signal at a predetermined magnitude in response to receipt of such input signal, and control means for controlling said changing means in discrete steps that are, respectively, proportional to the magnitude of at least one of such input and output signals, progress transducer means for detecting the progress of such process, and search means for sensing whether respective events occur at expected positions in the progress of such process.

4,349,884

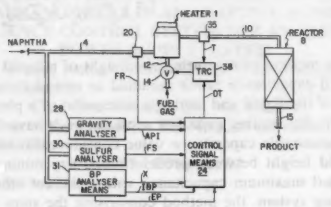
FEEDSTOCK TEMPERATURE CONTROL SYSTEM

Charles A. Ganster, Houston, and Gerald V. Nelson, Nederland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,724

Int. Cl.³ C10G *21/00*

U.S. Cl. 364—557 **12 Claims**



1. A control system for controlling the temperature of naphtha being fed to a reactor in a hydrotreating unit comprising heater means receiving the naphtha for heating the naphtha in accordance with a control signal DT corresponding to a desired temperature for the naphtha entering the reactor and providing the heated naphtha to the reactor, gravity analyzer means for sensing the API gravity of the naphtha and providing a signal API corresponding thereto, sulfur analyzer means for sensing the sulfur content of the naphtha and providing a corresponding signal FS, boiling point analyzer means for sensing the 50% boiling point temperature, the initial boiling point temperature and the end point temperature of the naphtha and providing corresponding signals X, IBP and EP, respectively, flow rate means for sensing the flow rate of the naphtha and providing a signal FR representative thereof, and control signal means connected to the heater means, to the gravity analyzer means, to the sulfur analyzer means, to the boiling point analyzer means and to the flow rate means for providing control signal DT in accordance with signals API, FS, X, IBP, EP and FR.

4,349,885

SET PRESSURE MEASURING SYSTEM

Leonard J. Thompson, Wrentham, Mass., assignor to Crosby Valve & Gage Company, Wrentham, Mass.

Continuation of Ser. No. 22,197, Mar. 20, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,549

Int. Cl.³ F16K *31/00*

U.S. Cl. 364—558 **6 Claims**

1. Apparatus for monitoring the set pressure of the valve coupled to a port in a pressure line having an internal pressure S_p, said port having an effective area A_s, wherein said valve includes a closure element movable between a first limit position sealing said port and a second limit position opening said port, and includes a springloaded means for biasing said closure element towards said first limit position, comprising:

A. position transducer for generating a position signal representative of the position of said closure element between said first and second limit positions,

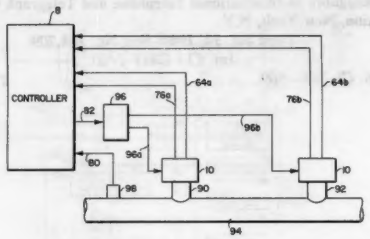
B. forcer means selectively operable to apply a force ramp to said closure element in the direction opposite to said bias provided by said springloaded means,

C. force transducer for generating a force signal representative of the force applied to the said closure element by said forcer means,

D. controller means selectively operable to control a set point measurement cycle, including:

means for activating said forcer means,

means for monitoring said position transducer and said force transducer, and for detecting a test time when said position signal is representative of a predetermined displacement of said closure element from said first limit position, and, in response to said detection, for disabling said forcer means and computing a signal T_p representative of the set pressure of said valve in accordance with



$$T_p = S_p + F/A_s$$

where F is representative of the force signal at said test time, S_p is representative of said internal pressure, and A_s is representative of the effective area of said port.

4,349,886

DEVICE FOR MODIFYING OR CONTROLLING THE SHAPE OF AN ELECTRICAL OUTPUT SIGNAL

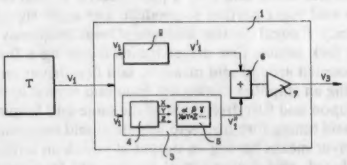
Jean-Pierre Ibar, Avenue de la Division Leclerc, Ballainvilliers (Essonne), France

Filed Mar. 24, 1980, Ser. No. 132,846

Claims priority, application France, Mar. 27, 1979, 79 07678; Feb. 1, 1980, 80 02296

Int. Cl.³ G01R *15/10*; G01K *7/14*

U.S. Cl. 364—573 **14 Claims**



1. Device for modifying and controlling the shape of an electrical output signal which is a function of a physical parameter supplied by a transducer, said device comprising an electrical circuit with at least two branches each receiving the input signal (V_1) to be transformed, one of the branches including a linear circuit effecting a linear transformation ($A_0 + A_1V_1$) of the input signal (V_1), where A_0 and A_1 are constants, and the other branch including a multiple linear circuit to effect a multiple linear transformation of the same input signal (V_1) by generating the intermediate signals ($X = A_2 + V_1$), ($Y = A_3 + V_1$) and ($Z = A_4 + V_1$) where A_2, A_3, A_4 are constants, and a combining circuit receiving the intermediate signals (X, Y, Z . . .) to combine them by multiplication or division in accordance with ($X^{\alpha}Y^{\beta}Z^{\gamma}$ . . .), where α,β

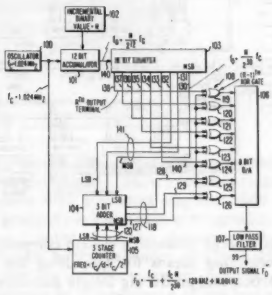
and γ are either -1, 0, or $+1$, at least one of the numbers (α, β,γ . . .) being negative, and an adder circuit receiving the linear signal ($A_0+A_1V_1$) from the first branch and the combination signal (X^{α}, Y^{β}, Z^{γ} . . .) from the second branch to add them and provide the transformed signal (V_3).

4,349,887

PRECISE DIGITALLY PROGRAMMED FREQUENCY SOURCE

Albert T. Crowley, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1980, Ser. No. 181,086
Int. Cl.³ H03B *19/00*
U.S. Cl. 364—703 **10 Claims**



1. A system for selectively generating any one of M signals frequency spaced apart of S Hz where S is a fixed value, and comprising:

first means for generating a first signal of frequency f_c;

second means responsive to said first signal to produce a first binary output signal of frequency $Nf_c/2^n$, where N is a variable integer and n is an integer;

first frequency divider means responsive to said first output signal to produce a second binary output signal of frequency $Nf_c/2^{n+m}$, where $f_c/2^{n+m}=S$ and m is an integer;

second frequency divider means responsive to said first signal to produce a third binary output signal of frequency f_c/d, where d is an integer $<n+m$; and

logic means responsive to said second and third binary output signal to produce a fourth output signal of average frequency $f_c/d+Nf_c/2^{n+m}$.

4,349,888

CMOS STATIC ALU

Philip S. Smith, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 8, 1980, Ser. No. 185,073
Int. Cl.³ G06F *7/48, 7/50*
U.S. Cl. 364—716 **6 Claims**

1. A CMOS static ALU comprising:

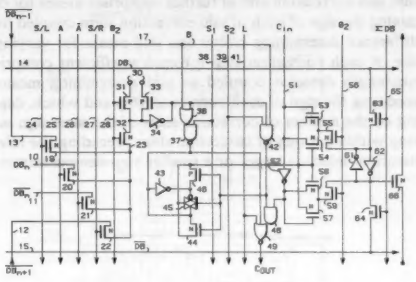
selection means for selecting a first operand from a plurality of inputs;

NOR logic means for providing an output representing the logical NOR of the first operand and a second operand in response to a first control signal;

NAND logic means for providing an output representing the logical NAND of the first and second operands;

first exclusive NOR logic means for providing an output representing the logical exclusive NOR of the outputs of the NOR and the NAND logic means;

second exclusive NOR logic means for providing an output representing the logical exclusive NOR of the output of the first exclusive NOR logic means and a carry input; and



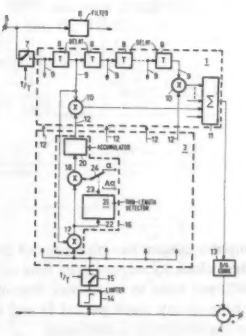
storage means for storing the output of the second exclusive NOR logic means for output from the ALU.

4,349,889

NON-RECURSIVE FILTER HAVING ADJUSTABLE STEP-SIZE FOR EACH ITERATION

Hendricus C. van den Elzen; Petrus J. Van Gerwen; Wilfred A. M. Snijders, and Nicolaas A. M. Verhoeckx, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 168,211
Claims priority, application Netherlands, Jul. 18, 1979, 7905577
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—724 **6 Claims**



1. An arrangement comprising a non-recursive filter having an input sampling circuit and means coupled to this input sampling circuit for generating a sequence of delayed versions of a signal applied to said input sampling circuit, an output circuit formed by a summing device for producing a filter output signal, a difference determining circuit coupled to this output circuit, means for applying the filter output signal and a reference signal to said difference determining circuit to produce an error signal, means coupled between said generating means and said output circuit for weighting said sequence of delayed versions of the input signal in accordance with a respective sequence of coefficients, correlation circuit means coupled between the output of said difference determining circuit and said weighting means for generating and iteratively adjusting, in positive and negative correction steps, each of said coefficients in said sequence of coefficients, said correlation circuit means having means for varying the size of said correction steps whereby the prescribed function of said error

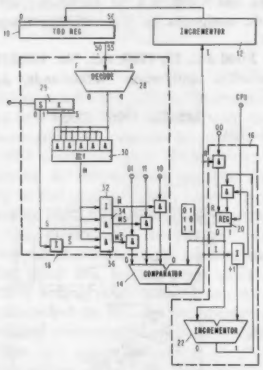
signal is minimized, the step-size for each correction step being determined by a step-size parameter selected from several step-size parameter having different values, characterized in that said correlation circuit further comprises means for determining the sign of each of said correction steps coupled to said difference determining circuit and said means for varying the size of each correction step for each coefficient comprises a run-length detector coupled to said determining means for receiving the sign of each correction step and which, depending on the number of correction steps of the same sign occurring within a group of correction steps preceding the relevant iteration, selects a larger or a smaller step-size parameter.

4,349,890

TIME OF DAY CLOCK CONTROL

David C. Chang, Pleasant Valley, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,811
Int. Cl.³ G06F *1/04*
U.S. Cl. 364—900 **3 Claims**



3. In a computer system having a time of day clock register run off a system clock by stepping the time of day clock register at two different rates to synthesize fractional relationship between the time of day clock period D and the system clock period T, the improvement comprising:

counting means for counting the number of pulses produced by the system clock,

binary comparator means for resetting said counter to 0 and incrementing the time of day register when it produces a compare signal,

logic circuit means responsive to binary counts in a number of stages of the register for feeding one binary number into said comparator on certain binary counts and another binary number into the register on other binary counts, and

circuit means for periodically feeding the contents of said counting means into said comparator for comparison with one of said binary numbers to produce said compare signal when said contents is equal to the one of said binary numbers,

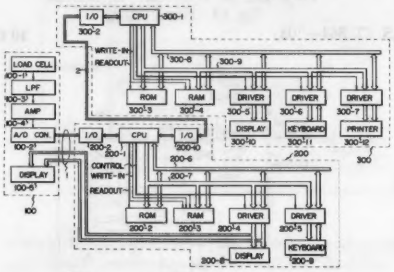
whereby the time of day register is incremented at one rate when said one binary number is fed into said comparator and another rate when said other binary number is fed into said comparator.

4,349,891

POSTAL CHARGE PROCESSING SYSTEM WHICH CALCULATES AND DISPLAYS THE DIFFERENCE BETWEEN THE POSTAL CHARGE AND THE STAMP FOR WHEN THE POSTAL CHARGE IS GREATER

Mitsuo Uchimura, Numazu, and Yoshiharu Nishimura, Mishima, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1980, Ser. No. 124,602
Claims priority, application Japan, Apr. 24, 1979, 54-50669
Int. Cl.³ G06F *15/28*
U.S. Cl. 364—900 **10 Claims**



1. A postal charge processing system comprising:

weight measuring means for measuring the weight of a postal article and producing weight data corresponding to the weight of the postal article;

first switching means for setting postal conditions including the way of mail and region of mailing destination and for generating postal condition data in accordance with the set postal conditions;

first memory means coupled to said first switching means for storing said postal condition data in accordance with the operation of said first switching means;

display means;

second switching means operated for producing a fee data;

second memory means coupled to said second switching means for storing said fee data produced in accordance with the operation of said second switching means; and

first data processing means coupled to said measuring means, to said display means and to said first memory means, said first data processing means including:

means for calculating the postal charge for said postal article based on the weight data from said measuring means and also based on the postal condition data stored in said first memory means and for supplying the calculated postal charge data to said display means for display thereon, and

means for calculating, in response to the operation of said second switching means, the difference between the calculated postal charge data and the fee data stored in said second memory means when the calculated postal charge data is greater in value than the fee data, and for supplying difference data corresponding to said difference to said display means for display thereon;

third memory means;

third switching means coupled to said first data processing means and to said third memory means, and being operable to cause said first data processing means to transfer said difference data to said third memory means for storage of said difference data;

printer means;

fourth switching means; and

second data processing means coupled to sajd fourth switching means, to said printer and to said third memory means, and including means responsive to the operation of said fourth switching means for causing said printer means to

print said difference data stored in said third memory means.

4,349,892

MAGNETIC BUBBLE DETECTOR

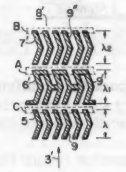
Ryo Suzuki, Kodaira; Keiichi Uehara; Teruaki Takeuchi, both of Kokubunji, and Masatoshi Takeshita, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,513

Claims priority, application Japan, Aug. 15, 1979, 54-103138; Aug. 15, 1979, 54-103139

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **14 Claims**



1. A magnetic bubble detector comprising a bubble expander which propagates magnetic bubbles in a predetermined direction in accordance with a rotating magnetic field and which expands them gradually in a direction orthogonal to the propagating direction, a bubble detecting element which is disposed in adjacency to said bubble expander on a rear side in which propagating direction of the magnetic bubbles and which detects the existence or non-existence of the magnetic bubble as an electric signal, said bubble detecting element comprising single pattern soft magnetic material-elements extending in said propagating direction of the magnetic bubbles, and a bubble sweeper which is disposed in adjacency to said bubble detecting element on a rear side in said propagating direction of the magnetic bubbles and which sweeps the magnetic bubbles, at least a width of said soft magnetic material-elements constituting said bubble detecting element as taken in said propagating direction of the magnetic bubbles being greater than a width of soft magnetic material-elements constituting said bubble expander as taken in said propagating direction of the magnetic bubbles.

4,349,893

MEMORY WITH CURRENT-CONTROLLED SERIAL-TO-PARALLEL CONVERSION OF MAGNETIC FIELD DOMAINS

Nelie J. Wiegman, and Karel E. Kuijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

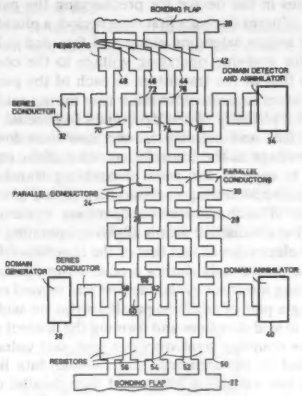
Filed Jul. 7, 1980, Ser. No. 166,509

Claims priority, application Netherlands, Jul. 17, 1979, 7905543

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—20 **6 Claims**

1. Device for the storage of digital information in the form of magnetic domains in a magnetizable layer under the control of a bias field transverse to the layer, containing, in addition, driving means in the form of at least one current conductor applied to said layer that can be driven by a cyclic electric current and has at least a meander-shaped part, wherein a path along the meander-shaped part of it is intended for the magnetic domains, in which said current conductor which is electrically singly connected comprises at least first and second parallel meander paths running in parallel and also a third conductor path transverse to these which, by means of a sequence of alterating currents in it, produces a path along it for the magnetic domains, and in which for conversion between serial and parallel drive of the domains said first and second meander paths are connected to the third conductor path owing to the fact that a first and second loop of the third



conductor path form, as terminal loops, part of said first and second meander paths respectively.

4,349,894

SEMICONDUCTOR MEMORY CELL WITH SYNTHESIZED LOAD RESISTORS

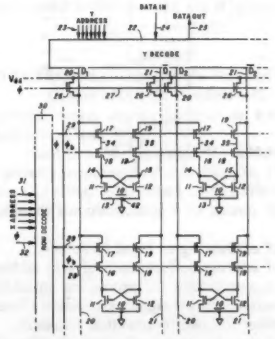
Edward R. Caudel, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 925,891, Jul. 19, 1978, Pat. No. 4,236,229. This application Nov. 24, 1980, Ser. No. 210,079

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **10 Claims**



1. A semiconductor integrated circuit device formed in a face of a body of semiconductor material as a static self-refresh memory comprising: an array of rows and columns of memory cells formed at said face wherein each cell includes a pair of driver transistors and first and second pairs of coupling transistors of the same channel conductivity type, each of the transistors having a current path between source and drain regions in said face and a control electrode formed over said current path; a pair of storage nodes formed in said face by said regions with no d.c. path via said storage nodes and driver transistors between terminals of a voltage supply; a pair of complementary data lins for each column, the data lines being in the form of elongated conductors in said face and defining column lines;

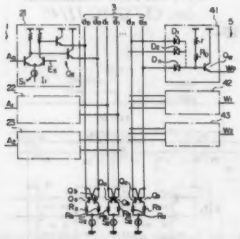
each pair of coupling transistors for each cell in each column having their current paths in said face connected separately in series between one of the data lines and one of the storage nodes; means in the device for precharging the pairs of data lines in all columns during a first time period; a plurality of first conductive means extending along said face and defining first row lines for applying operating voltage to the control electrodes of a first of the transistors in each of the pairs of coupling transistors separately for each row during said first time period; and a plurality of second conductive means extending along said face and defining second row lines for applying operating voltage to the control electrodes of the other of the transistors in each of the pairs of coupling transistors separately for each row during a second time period after said first time period in each read/write operating cycle or refresh cycle; the first conductive means applying operating voltage to the control electrodes of said first of the transistors during said second time period only during a read/write operating cycle and not during a refresh cycle, the first and second conductive means being a pair of adjacent parallel strips on said face perpendicular to said data lines and forming the control electrodes for all of the coupling transistors in a row; said voltage supply being applied to the memory cells via said data lines and a conductive line extending along said face parallel to and between said data lines and contacting ends of the source-to-drain paths of the driver transistors.

4,349,895

DECODER CIRCUIT OF A SEMICONDUCTOR MEMORY DEVICE

Hideaki Isogai, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 21, 1980, Ser. No. 141,932
Claims priority, application Japan, Apr. 26, 1979, 54/51722
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—230 **6 Claims**



1. A decoder circuit of a semiconductor memory device, comprising:

a sequence of address signal input terminals,

a plurality of address buffers, each of said address buffers including a gate circuit for producing an address signal and an inverted address signal, a constant current source and an emitter follower connection transistor,

a plurality of decoder lines consisting of pairs of decoder lines connected to an output of said address buffer producing an address signal and another output of said address buffer producing an inverted address signal, each pair of said decoder lines being connected to said emitter follower connection transistor of said address buffer and a constant current source, a main part of the current passing through only one decoder line of each pair of said decoder lines,

a plurality of word drivers having a matrix of diodes, a resistor circuit connected to a power source and a transistor connected to a word line, each of said diodes being connected between one of said decoder lines and a junction of said resistor circuit and the base of said transistor, and,

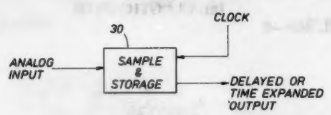
a sequence of word lines.

4,349,896

DIGITAL ACOUSTIC LOGGING METHOD AND APPARATUS

Hugh E. Hall, Jr., Huntsville, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 1, 1980, Ser. No. 211,601
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—26 **7 Claims**



1. The method of accurately identifying a wave segment in a seismic analog logging signal, comprising

determining a presumed compression wave in real time, comprising

selecting a time duration before the receipt of the compression wave in the received signal that includes substantially only inherent received noise,

determining the rms amplitude value of the received noise during the selected noise time duration,

presetting a peak detector to have a value equal to the determined rms value plus a predetermined added value,

detecting with the preset peak detector the received signal following the selected noise time duration for the presumed presence of the compression wave by analog sampling the amplitude at regular intervals, three successive samples of received signal from the peak detector indicating the presence of the presumed compression wave onset, and

storing the amplitude values of a predetermined length of the presumed compression wave,

sequentially analog sampling the amplitude values of a real time portion of the logging signal in adjacent discrete time segments,

sequentially individually storing the sampled amplitude values,

reading the stored amplitude values of the presumed compression wave over an expanded period of time in excess of the real time duration of the sampled portion,

convolving the stored amplitude values of the sequentially stored sampled amplitude values over an expanded period of time in excess of the real time duration of the sampled portion with respect to the read presumed compression wave to detect the wave segment.

4,349,897

BISTATIC DOPPLER UNDERWATER INTRUSION DETECTION SONAR

Hollis Boehme; Garland R. Barnard, both of Austin; Larry L. Mellenbruch, Valle, and Danny W. Dickens, Round Rock, all of Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,068
Int. Cl.³ G01S *15/04, 7/66*
U.S. Cl. 367—98 **13 Claims**

1. A bistatic sonar system for detecting intrusion into a predetermined zone of a body of water, said system comprising:

a source of a reference frequency;

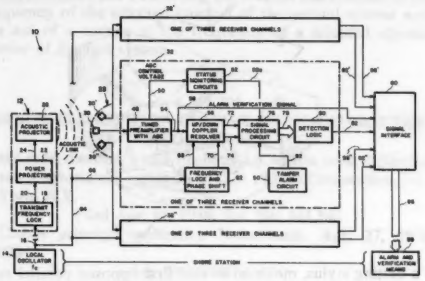
fixed, continuous wave transmitter means, responsive to said reference frequency, for insonification of said zone with acoustic energy at a predetermined frequency;

fixed receiver means including hydrophone means, separately disposed from said transmitter means, for receiving acoustic

signals from said zone and providing corresponding electrical signals as an output;

automatic gain controlled amplifier means, responsive to said hydrophone means, for amplifying target return signals with a gain that is varied in response to slowing changing background noise;

up and down Doppler resolver means, responsive to said reference frequency and to the output of said amplifer means, for providing target signal containing up Doppler and down Doppler sideband frequencies;



signal processing means, responsive to said up Doppler and down Doppler sideband frequencies, for effecting filtering and detection of signals at a plurality of fixed bandpass frequencies within said sideband frequencies and for repetitively providing a multiple bit binary word representative of samples of a plurality of detected return signal conditions including energy, spectral slope, and stroke content;

logic means, responsive to predetermined combinations of rates of occurrence of word bit binary levels, for generating a utilization initiating signal; and

utilization means, responsive to said utilization initiating signal, for effecting a predetermined utilization function.

4,349,898

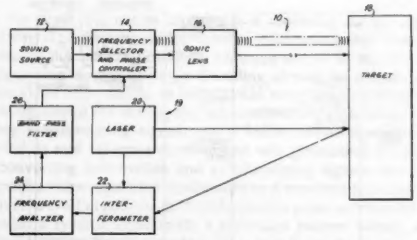
SONIC WEAPON SYSTEM

William Drewes, 100 Ellison Ave., Bronxville, N.Y. 10708, and Edward M. Vlicki, Elmwood Park, N.J., assignors to William Drewes, Bronxville, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,302

Int. Cl.[3] H04B *1/02*

U.S. Cl. 367—138 **36 Claims**



1. A system for transmitting a parametrically pumped sonic signal through a transmission medium to a remote location comprising:

a sound source

means for separating the sound from said source into a plurality of discrete frequency components including a fundamental component and at least one additional component, each additional component having a frequency twice that of the next lowest frequency component;

means for adjusting the phase difference between each frequency component and the next lowest frequency component to substantially 90°;

means for colinearly focusing said components on said remote location; and

means for rendering said transmission medium nonlinear between said focusing means and said remote location.

4,349,899

MUSIC BOX HAVING TIME-SOUNDING FUNCTION

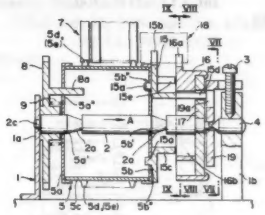
Fumito Komatsu, Shiojiri, and Junichiro Shinozaki, Chino, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Suwa, Japan

Filed Jan. 15, 1980, Ser. No. 112,268

Claims priority, application Japan, Jan. 17, 1979, 54-4837[U]

Int. Cl.[3] G04B *21/02*; G10F *1/06*

U.S. Cl. 368—75 **6 Claims**



1. Music box having time-sounding function comprising:

a rotatabe drum equipped with chiming pins at the side of its leading direction of rotation and time-sounding pins successively in the rotating direction;

a means to drive said drum;

a vibration tooth to engage the pins as the drum moves;

a means to control the forward and backward movement of said drum to the vibration tooth;

and a means to permit the drum to delay one pitch as the time-sounding pin is engaged and to forcibly push the drum forward as the chiming pin is engaged.

4,349,900

ELECTRONIC TIMEPIECE WITH ERROR COMPENSATION CIRCUIT

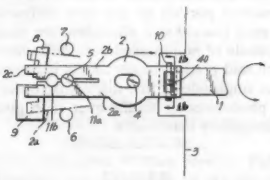
Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Chuo, Japan

Filed Feb. 26, 1980, Ser. No. 124,892

Claims priority, application Japan, Feb. 26, 1979, 54/21639

Int. Cl.[3] G04C *9/00*; G04B *29/00*; H01H *9/00*

U.S. Cl. 368—187 **11 Claims**



1. An electronic timepiece including a plurality of functional modes for display, comprising:

circuit means for varying the functional mode for display;

switch means, said switch means being adapted for actuation in a plurality of modes in sequence, selected modes of switch actuation in a selected sequence initiating at least one selected variation in a display, said switch means inputting signals to said circuit means for varying the functional mode;

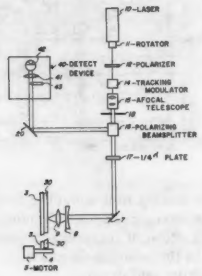
compensating circuits, said compensating circuits being adapted to discriminate between the occurrence of said switch modes of actuation in said selected sequence or in a non-selected sequence, said compensating circuits outputting control signals to said circuit means for varying the functional mode for display, variations in said display resulting from at least one actuation in said non-selected sequence being negated by a subsequent actuation in said non-selected sequence, said display being restored to the state existing prior to said non-selected sequence.

4,349,901

APPARATUS AND METHOD FOR READING OPTICAL DISCS

Dennis G. Howe, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,486
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—45 **8 Claims**



1. Apparatus for reading optical discs of the type having high density information recorded as tracks of phase-modulating marks of a given operative spacial frequency bandwidth; said apparatus comprising:

(a) first means for directing a beam of coherent read light into focus as a read-spot on such tracks;

(b) means for scanning said read spot along said tracks by providing relative movement between such optical disc and said light directing means;

(c) photodetector means spaced from such optical disc;

(d) second means for directing the zero diffraction order of read light from the tracks and one first diffraction order of read light from the tracks into substantially superimposed relation on said photodetector means; and

(e) first masking means constructed and located between the optical disc and said photodetector means for masking a predetermined portion of said zero diffraction order of light passing toward said photodetector means such that the amplitude of non-masked zero diffraction order light falling on said photodetector means is generally equal to the mean amplitude of first diffraction order light falling on said photodetector means over such given operative spacial frequency bandwidth.

4,349,902

PIEZOELECTRIC TRANSDUCER FOR RECORDING VIDEO INFORMATION

John Valachovic, New Brunswick; Gerard A. Alphonse; John H. Reisner, both of Princeton, and Karl-Friedrich Etzold, Hillside, all of N.J., assignors to RCA Corporation, New York, N.Y.

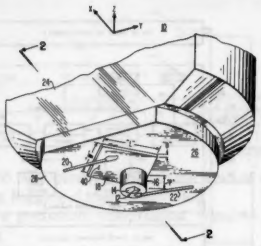
Filed Oct. 27, 1980, Ser. No. 201,057
Int. Cl.³ G11B *3/32*
U.S. Cl. 369—132 **9 Claims**

1. Apparatus for electromechanically recording signal information having a bandwidth of several megahertz along a track on a record medium, said apparatus comprising the combination of:

a mounting pedestal having a mounting surface;

a base member, coupled to said mounting surface of said mounting pedestal, having a first axis of symmetry and a first surface perpendicular to said first axis;

a piezoelectric element having a second axis of symmetry and first and second opposite parallel surfaces perpendicular to said second axis; and



a cutting stylus, mounted to said first opposite parallel surface of said piezoelectric elements having a cutting face, said cutting stylus being arranged on said piezoelectric element such that said cutting face is perpendicular to a tangent of said track;

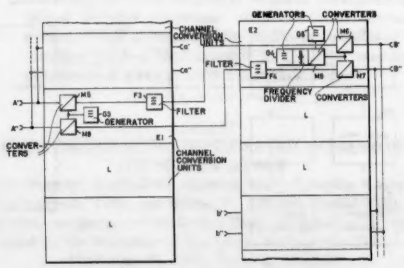
said second opposite surface of said piezoelectric element being attached to said first surface of said base member and said piezoelectric element being arranged on said base member in an asymmetrical fashion to reduce spurious motion of said stylus cutting face along said track.

4,349,903

SWITCHING OF CHANNELS BETWEEN TWO PREMODULATION SYSTEMS

Ulrich Kübler, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,812
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903943
Int. Cl.³ H04J *1/04*; H04Q *11/02*
U.S. Cl. 370—57 **6 Claims**



1. In the transmission of information in first and second carrier frequency systems occupying the same frequency bands and each composed of a succession of channel carriers having different respective frequencies, each channel carrier defining a respective transmission channel and being modulated with information to be transmitted in its associated channel, by the steps of providing a respective premodulation carrier for each system, causing the information to be transmitted in each channel to premodulate the premodulation carrier of its associated system, and modulating each channel carrier with the

premodulation carrier modulated with the information to be transmitted in its associated channel, the premodulation carriers for the two systems having respectively different frequency positions relative to the frequency band of the two systems, the improvement comprising a method for switching at least one channel of the first system into a selected channel of the second system by the steps of: shifting the frequency of the modulated channel carrier of the one channel of the first system with the aid of an unmodulated channel carrier; filtering the channel to be switched through out of the shifted signal by means of a bandpass filter; and converting the filtered-out channel to the frequency of the selected channel of the second system with the aid of a carrier at the frequency of a selected channel carrier of the first system.

4,349,904
ERROR CORRECTION CIRCUIT USING CHARACTER PROBABILITY

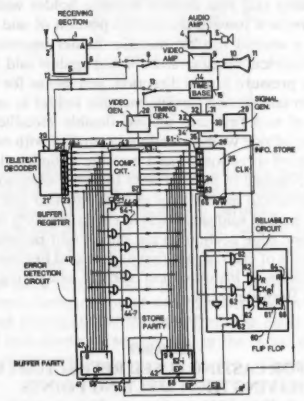
Peter J. H. Janssen, and Wilhelmus J. Christis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,546

Claims priority, application Netherlands, Apr. 27, 1979, 7903340

Int. Cl.³ G06F *11/14*

U.S. Cl. 371—69 **7 Claims**



1. An error correction circuit for a receiving device for receiving digitally transmitted symbol information, the transmission of this information being repeated one or more times, the receiving device having a decoding circuit for decoding the received information, an information store coupled to said decoding circuit for storing the information, a circuit for generating synchronizing signals and a video converter circuit coupled to said information store and said generating circuit for converting information and synchronizing signals into a composite video signal for application to a standard television receiver, a symbol address in the information store corresponding with a symbol location on a television picture screen, a symbol location being a portion of a text line which is displayed with a number of video lines greater than one, the error correction circuit being coupled to said decoding circuit and said information store and including means coupled between said decoding circuit and said information store for checking newly received symbol information against symbol information stored in the information store for the corresponding symbol location, a write-switch having one input coupled to said decoding circuit and an output coupled to said information store, and a write-setting circuit, coupled to another input of said write-switch, which determines whether the newly received information is written or not written into the information store, said write-setting circit having an input coupled to said checking means whereby the results of said checking are a factor in the setting of said write-switch by said write-setting circuit, characterized in that the error correction circuit further comprises a classification circuit coupled to the output of said decoding circuit for classifying a newly received and decoded symbol in one of at least two classes on the basis of the probability of occurrence of the newly received symbol, the input of the classification circuit being coupled to another input of the write-setting circuit.

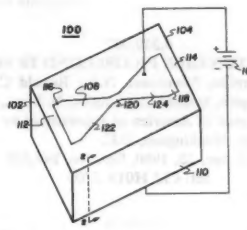
4,349,905
TAPERED STRIPE SEMICONDUCTOR LASER

Donald E. Ackley, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 22, 1980, Ser. No. 171,080

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—46 **3 Claims**



1. A semiconductor laser comprising:

a plurality of layers of semiconducting material including an active layer in which charge recombination and emission of optical radiation are induceable by injection of charge carriers into said active layer;

a first mirrored face and a second mirrored face at opposite ends of said active layer;

stripe means extending between said first and second mirrored faces for laterally confining the optical radiation and the charge carriers, said stripe means having a first region of tapered width for substantially preventing lasing in more than one mode, said stripe means having lower refractive index than one of said layers, for permitting leaky mode operation of said laser; and

electrode means for supplying electrical current.

4,349,906
OPTICALLY CONTROLLED INTEGRATED CURRENT DIODE LASERS

Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 18, 1979, Ser. No. 76,633

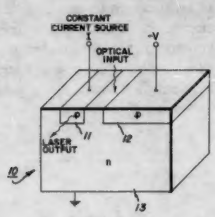
Int. Cl.³ H01S *3/19*

U.S. Cl. 372—50 **21 Claims**

1. A light emitting laser integrated on a single semiconductor chip and operating as a bipolar transistor device, wherein the improvement is characterized by:

a light sensitive region, said laser including means for detecting an external input light signal of a first modulated intensity applied to said light sensitive region of said laser, said light signal causing a change in the electric current

flow to at least one portion of said laser resulting in an output light signal of an amplified modulated intensity



corresponding to said modulated intensity of the input light signal.

4,349,907

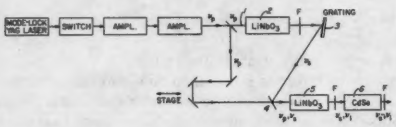
BROADLY TUNABLE PICOSECOND IR SOURCE

Anthony J. Campillo, Nesconset, N.Y.; Ronald C. Hyer, and Stanley J. Shapiro, both of Los Alamos, N. Mex., assignors to The United Stated of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 23, 1980, Ser. No. 143,059

Int. Cl.³ H01S *3/00*

U.S. Cl. 372—92 **18 Claims**



1. An apparatus for producing narrow-bandwidth broadly and continuously tunable, picosecond duration, coherent infrared radiation, comprising:

(a) means for repetitively producing fixed wavelength, high energy picosecond duration coherent infrared light pulses;

(b) means for receiving and dividing said high energy pulses into two parts, and directing each portion along a different pathway, one part along path 1 and the other along path 2;

(c) means for generating and emitting picosecond, broadbanded, coherent signal and idler frequencies from amplification of spontaneous noise of the required frequencies, inserted in path 1 and responsive to and using as its source of energy said high energy light pulses;

(d) means for receiving and selecting a particular spectral component and a particular spatial component of coherent radiation selected from the group of said emitted coherent signal and idler frequencies;

(e) means for receiving, further amplifying and emitting selected spectral-spatial components of said coherent radiation selected from the group of said signal and idler frequencies and regenerating a corresponding idler and signal frequency, respectively, inserted in path 2 and responsive to and using as a source of energy said high energy light pulses; and

(f) means for receiving and mixing said amplified selected spectral-spatial components of said coherent radiation selected from the group of said signal and idler frequencies and said regenerated corresponding idler and signal frequencies, respectively, producing and emitting difference frequencies of longer wavelength.

4,349,908

GAS LASER TUBE COMPRISING A CHANNEL-SHAPED HOLDER PAIR FOR COMPRESSIVELY HOLDING A BREWSTER PLATE AT PLATE CORNERS

Hiroo Hara, and Noboru Taguchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,722

Claims priority, application Japan, Aug. 23, 1979, 54-116128[U]

Int. Cl.³ H01S *3/02*

U.S. Cl. 372—103 **5 Claims**

1. An internal mirror type gas laser tube comprising a cylindrical casing for containing a laser active medium therein, and first and second mirrors disposed at opposite ends of said cylindrical casing, said cylindrical casing including at one of said opposite ends a metallic cylindrical member, a first flexible metallic holder inserted in said metallic cylindrical member, a Brewster plate inserted in said metallic cylindrical member and abutted against said first flexible metallic holder with a pressure in a direction toward the central portion of said cylindrical casing, a second flexible metallic holder inserted in said metallic cylindrical member and abutted against said Brewster plate with a pressure in said direction, and means for applying a pressure to said second flexible metallic holder in said direction, each of said first and second flexible metallic holders having a pair of side walls extending in parallel with each other and in the axial direction of said metallic cylindrical member and means disposed in parallel with the axial direction of said metallic cylindrical member for connecting said side walls to each other, each of said side walls having a plurality of protrusions at its one edge portion on the side of said Brewster plate, the protrusions of each of said first and second flexible metallic holders forming a Brewster cut surface and being abutted against said Brewster plate.

4,349,909

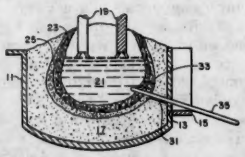
PROCESS FOR CASTING FUSED REFRACTORY OXIDES HAVING HIGH MELTING POINTS

Paul Cichy, Buffalo, N.Y., assignor to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 45,485, Jun. 4, 1979, Pat. No. 4,304,954. This application Jul. 6, 1981, Ser. No. 280,726

Int. Cl.³ H05B *7/00*

U.S. Cl. 373—84 **5 Claims**



1. A process for the production of fused refractory oxide materials having fusion points greater than 2400° C. which comprises the steps of:

(a) insulatingly supporting a vertically elongated bed of said refractory oxide material in particulate form at its bottom and sides with additional amounts of said particulate refractory oxide material which will remain unmelted through the process,

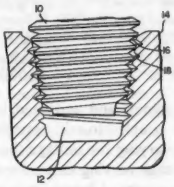
(b) exposing the upper surface of said bed to a plurality of electrodes positioned over said bed to form at least one arc adjacent to the upper surface of said bed,
(c) melting a portion of said bed by a flow of electric current from one of said electrodes to another, forming a zone of liquid refractory oxide material surrounded by an open-topped layer of congealed refractory oxide material,
(d) removing a portion of particulate material along the side of said bed to expose said congealed layer at a point adjacent to the bottom portion of said zone of liquid material,
(e) piercing said congealed layer and tapping the zone of liquid material, and
(f) tilting said bed to pour molten refractory oxide material from said liquid zone to a point outside of said bed.

4,349,910

METHOD AND APPARATUS FOR ORIENTATION OF ELECTRODE JOINT THREADS

Herman M. Belz, Berea, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 28, 1979, Ser. No. 79,886
Int. Cl.³ H05B 7/14
U.S. Cl. 373—91 **12 Claims**



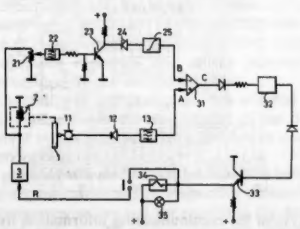
1. An electrode section having in at least one end a threaded socked capable of receiving a threaded electrode end or a threaded connecting pin, and on the periphery of said electrode section end and index mark for the purpose of alignment with a similar mark on the end of another electrode section to facilitate screwing the two electrode sections together,
said index mark designating a preselected reference point on the thread configuration of said threaded socket at a predetermined perpendicular distance from the plane of the end face of said electrode section end in the radial plane of the center of said mark.

4,349,911

SAFETY DEVICE FOR ELECTRODES OF AN ELECTRIC STEEL-MAKING FURNACE

Joseph M. W. Orbans, rue Simon Radoux, 1, 4000 Liege, Belgium

Filed Dec. 5, 1980, Ser. No. 213,378
Claims priority, application Belgium, Dec. 6, 1979, 198456
Int. Cl.³ H05B 7/148
U.S. Cl. 373—105 **4 Claims**



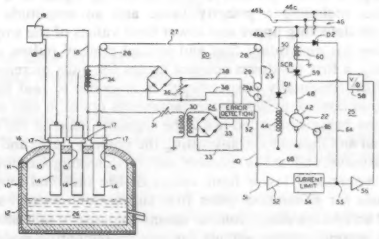
1. A safety device for protecting electrodes in an electric steel-making furnace, comprising a regulating device for producing a current regulating the motion of each electrode in dependence on the current travelling through the electrode, said safety device comprising:
first means connected to measure the regulating current and to produce set-value signal whenever a predetermined threshold value of the regulating current is exceeded;
second means coupled to the electrode-holder for detecting whether the electrode is moving and producing and electric signal having a first state when the electrode moves and a second state when the electrode is at a stop; and
a comparator device connected to receive the set-value signal at a first input and to receive the electric signal produced by the second means at a second input, the comparator device being adapted to produce a control signal having two states, namely a first state in response to two simultaneous input signals each having a first predetermined state and a second state in response to two simultaneous input signals having different states, the control signal being applied to a control input of the regulating device so that when the electrode does not move in response to a regulating current in excess of said threshold regulating current the regulating device automatically raises the electrode.

4,349,912

ELECTRODE POSITIONING CONTROL

James R. Bello, Pittsburgh, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1981, Ser. No. 249,096
Int. Cl.³ H05B 7/152
U.S. Cl. 373—105 **13 Claims**



1. An electric arc furnace having at lease one electrode,
drive means for positioning said electrode relative to a furnace charge,
an energy source coupled to said drive means for operating the same,
error detection circuit means coupled to said electrode for generating an error signal functionally related to the magnitude of electrode current,
electrical energy flow control means coupled to said energy source and said drive means, controller means coupled to said error detection circuit means and to flow control means, said controller means being responsive to said error signal for controlling the flow of electrical energy through said flow control means to said drive means whereby said electrode will be positioned relative to said furnace charge in accordance with electrical conditions in said electrode.

4,349,913

METHOD AND APPARATUS FOR REDUCING THE DEMAND ON THE NUMBER OF TRANSFERRED BITS WHEN TRANSFERRING PCM INFORMATION

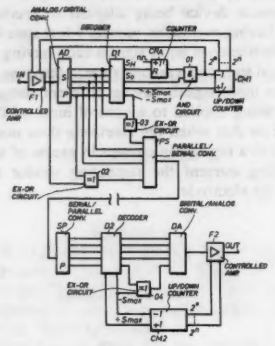
Karl I. L. Skoog, Farsta, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE78/00097, § 371 Date Aug. 30, 1979, § 102(e) Date Jul. 5, 1979, PCT Pub. No. WO79/00462, PCT Pub. Date Jul. 26, 1979

PCT Filed Dec. 18, 1978, Ser. No. 154,405

Int. Cl.³ H04L *3/00*

U.S. Cl. 375—25 **13 Claims**



9. In a PCM-information transfer system wherein the PCM-words transferred from a transmitter to a receiver are normally represented by polarity information, a segmented code and an amplitude code, said amplitude code indicating a level within an amplitude segment represented by a segment code, apparatus for transmitting PCM-words representing the amplitude and polarity of an analog signal merely by transferring binary words comprising polarity information and an amplitude code and no segment code whereby the number of bits transferred is reduced, said apparatus comprising: at the transmitter, analog-to-digital means for converting an analog signal to a digital value, including a polarity value and an amplitude value, means detecting upper and lower limit values of the amplitude values for generating first and second control pulses, respectively, a first up/down counter means for units incrementally and decrementally, respectively, in response to said first and second control pulses, the instantaneous count in said counter means being associated with the segment code of the analog signal and means for transmitting the polarity value and amplitude value, and; at the receiver, second detecting means detecting upper and lower limit values of the received amplitude values for generating other first and second control signals, and second up/down counter means response to said other first and second control signals for unit incrementing and decrementing, respectively, whereby the count value accumulated in said second up/down counter means represents a segment value, and digital-to-analog means for converting the received polarity value, the received amplitude value and the accumulated count value representing a segment value to an analog signal.

4,349,914

BIT SYNCHRONOUS SWITCHING SYSTEM FOR SPACE DIVERSITY OPERATION

Randall G. Evans, San Jose, Calif., assignor to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Apr. 1, 1980, Ser. No. 136,584

Int. Cl.³ H04B *7/08*; H04L *1/06*

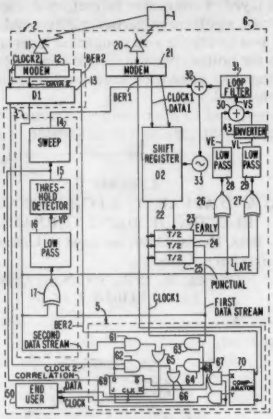
U.S. Cl. 375—40 **13 Claims**

9. Apparatus comprising the elements of:

a source of binary-encoded electromagnetic radiation;

first and second receivers spaced remotely from each other and from said source for receiving the radiation, each receiver comprising a demodulator which produces a baseband signal containing said binary information;

means for establishing correlation between the baseband signals comprising a variable delay element coupled to one of



said baseband signals and activated by a variable voltage element, means coupled to said variable voltage element for monotonically varying the voltage thereon, and means coupled to said voltage varying means for deciding when correlation has been achieved based upon a preselected correlation criterion.

4,349,915

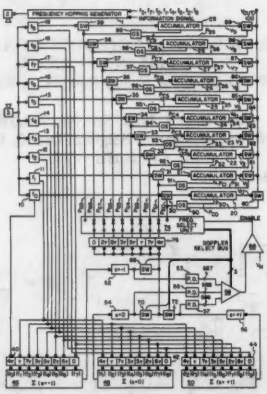
MINIMIZATION OF MULTIPATH AND DOPPLER EFFECTS IN RADIANT ENERGY COMMUNICATION SYSTEMS

John P. Costas, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,813

Int. Cl.³ H04L *1/04*

U.S. Cl. 375—40 **3 Claims**



2. In a system for communicating information from a transmitter to a receiver, through a medium in which transmitted energy representative of the information is subject to multipath delay spread effects and doppler frequency-shift effects, where the information is transmitted in the form of a series of modu-

lated information pulses of differing nominal frequencies, the nominal frequencies of successive pulses being repeatedly shifted through a predetermined sequence of F frequencies repeated every transmitter time frame of period $T=F\tau$, where τ equals the duration of each information pulse and where the modulation represents the information, each of said information pulses being received in the form of a plurality of doppler-shifted arrival pulses which travelled different paths of propagation,

an improved apparatus for reproducing the information at the receiver, said apparatus comprising:

(a) a plurality of detection units, each adapted to detect arrival pulses received at a distinct frequency, the range of frequencies detected being broad enough to include all doppler shifted frequencies which will be received at predetermined doppler shifts occurring over an expected range of relative velocities of the transmitter and the receiver, each of said detection units being further adapted to produce, from each arrival pulse detected thereby, a demodulated arrival pulse simultaneous therewith, said demodulated arrival pulse having a polarity representing the information communicated by the arrival pulse and having a magnitude representing the magnitude of the arrival pulse;

(b) a plurality of delay units each utilized to test for the existence of one of the predetermined doppler shifts, each unit including F delay elements connected to respective ones of the detection units adapted to detect the doppler-shifted frequencies at which the arrival pulses will be received when one of the predetermined doppler shifts exists, each delay element delaying the detected arrival pulses produced by the detection unit connected thereto by the number of time intervals τ by which the corresponding transmitted frequency precedes a selected one of the transmitted frequencies in the sequence;

(c) a plurality of analog summers utilized in conjunction with the delay units to test for the existence of one of the predetermined doppler shifts, each summer being connected to a respective one of the delay units to continuously sum the magnitudes of the detected arrival pulses delayed thereby and to produce a series of composite pulses therefrom;

(d) comparator means for determining which analog summer is producing the composite pulses of greatest magnitude and for producing a doppler select signal representing the doppler shift tested for by the summer, said doppler select signal representing the existing doppler shift and said composite pulses representing the propagation delays at which each arrival pulse is received;

(e) switching means for receiving the composite pulses and the doppler select signal, and for passing to an output thereof the composite pulses produced by the summer testing for the doppler shift represented by said doppler select signal;

(f) a delay unit connected to the output of the switching means for receiving the composite pulses passed thereto and producing F replicas of each pulse after delays of 0, τ, 2τ, . . . $(F-1)\tau$, the replicas of each composite pulse passed being produced simultaneously with the reception of F arrival pulses detected at the F doppler-shifted frequencies received, and at the propagation delay represented by the composite pulse;

(g) a plurality of accumulators each adapted to algebraically accumulate the magnitudes of the demodulated arrival pulses produced by a respective one of the detection units;

(h) a plurality of switches, each connected between one of the accumulators and its respective detection unit;

(i) a frequency select unit for receiving the doppler select signal and the F replicas of each composite pulse passed, said doppler select signal causing the F replicas to be applied as gating pulses to respective ones of the F switches connected to the detection units adapted to detect the doppler-shifted frequencies received, the specific switch to which each of the F gating pulses is applied being selected such that the switch closes each time a demodulated arrival pulse is produced by the detection unit connected thereto and passes said pulse to the connected accumulator;

(j) means for sampling the accumulation in each accumulator after the magnitudes of all demodulated arrival pulses representing the information communicated by a single information pulse have been accumulated thereby, the sequential samples thus formed representing the information transmitted; and

(k) means for resetting each accumulation to a predetermined magnitude after it is has been sampled.

4,349,916

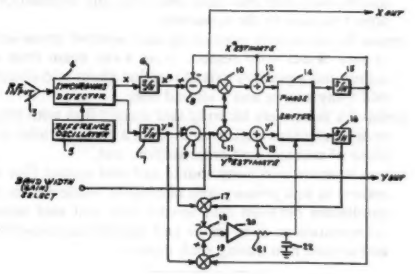
ADAPTIVE INTERFERENCE TRACKER FOR SUPPRESSION OF NARROW BAND INTERFERENCE

Allan W. Roeder, Whitesboro, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 6, 1980, Ser. No. 175,795

Int. Cl.³ H04B *1/10*

U.S. Cl. 375—103 **5 Claims**



1. An adaptive interference tracker for suppression of narrow band interference comprising:

a synchronous detector deriving in-phase and quadrature baseband signals from an RF input signal,

signal sampling means sampling the output of said synchronous detector to provide in-phase and quadrature sample data baseband signals,

means providing a bandwidth scaling constant,

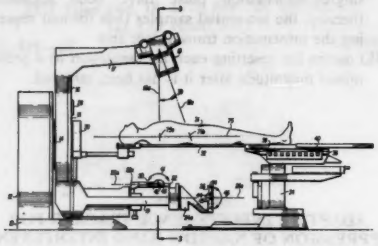
interference signal estimating means for generating from said in-phase and quadrature sample data baseband signals and said bandwidth scaling constant estimated in-phase and quadrature interference signals, said interference signal estimating means comprising data shifting integrator means, multiplier means receiving said in-phase and quadrature output signals and said bandwidth scaling constant and outputting its products to said phase shifting integrator means, an estimated interference signal feedback loop returning the output of said phase shifting integrator means to said phase shifting integrator means and to a subtractor means, and a phase shift tracking feedback loop between the output of said phase shifting integrator means and the output of said signal sampling means controlling the phase of said phase shifting integrator means to track interfering signal frequency, and

said subtractor means for subtracting said estimated in-phase and quadrature interference signals from said sample data baseband signals to provide in-phase and quadrature output signals.

4,349,917
TOMOGRAPHIC METHOD AND APPARATUS

Robert M. Moore, Midlothian, Va., assignor to Kermath Manufacturing Corporation, Richmond, Va.

Continuation of Ser. No. 963,704, Nov. 24, 1978, abandoned.
This application Jun. 9, 1980, Ser. No. 157,602
Int. Cl.³ G03B 41/16
U.S. Cl. 378—24 19 Claims



1. Tomographic radiological apparatus having an x-ray source, an object support and a film holder for providing an image of a selected cross-section of a given object, said apparatus further comprising:

means for recording reference data on a first film within a holder, said reference data indicating the location of the object relative to the apparatus;

means for accurately positioning said selected cross-section of said object with respect to an x-ray beam from said source and a primary axis of rotation about said object by said x-ray source and a second film;

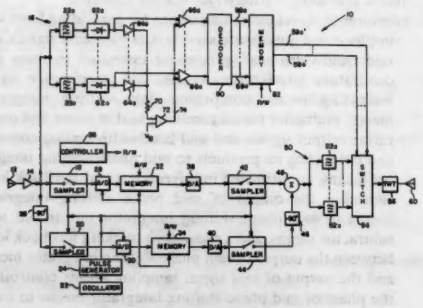
means for accurately locating said second film with respect to said reference-data so as to be in a plane parallel to the plane of said selected cross-section; and,

means to move said x-ray source and said second film with respect to said primary axis of rotation while maintaining parallelism between said second film and said selected cross-section so as to image said selected cross-section at said second film during such motion.

4,349,918
DIGITAL MEMORY SYSTEM

Bruce E. Gordon, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed May 21, 1980, Ser. No. 152,015
Int. Cl.³ H04B 13/00, 15/00; H03H 17/00
U.S. Cl. 455—20 4 Claims



1. A digital memory system comprising:

(a) means for separating an input signal into a plurality of signal channels, each one of the signals in each one of the channels having a frequency f;

(b) means for storing samples of the signals fed to each of the plurality of signal channels at a rate less than the Nyquist sampling rate, 2f;

(c) means for sequentially reading the stored samples from the storing means;

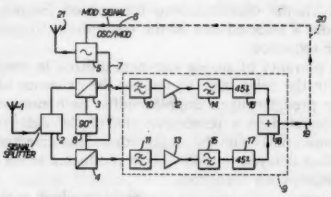
(d) means for combining the samples read from the storing means into a composite signal having a plurality of frequency components separated in frequency from one another by an amount having a predetermined relationship to the rate at which samples were stored in the storing means; and

(e) means, responsive to the frequency of the input signal and fed by the composite signal, for coupling a selected one of the produced plurality of frequency components of the composite signal to an output.

4,349,919
TRANSMITTER/RECEIVERS CAPABLE OF CONTEMPORANEOUS TRANSMISSION/RECEPTION

Christopher K. Richardson, Romsey, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 30, 1980, Ser. No. 164,146
Claims priority, application United Kingdom, Jul. 6, 1979, 7923731
Int. Cl.³ H04B 7/16, 1/54
U.S. Cl. 455—23 11 Claims



1. A communication transmitter/receiver for contemporaneous transmission and reception between more than two such transmitter/receivers, the transmitter/receiver comprising:

oscillator means, capable of being phase modulated in accordance with a phase deviation, for providing an oscillator output signal for transmission, wherein the phase deviation does not substantially exceed 90°;

aerial means for transmitting said oscillator output signal and for accepting a received signal;

first mixer means for mixing said oscillator output signal for transmission with said received signal to produce a first mixer output signal, said first mixer means having a first input terminal for receiving said oscillator output signal for transmission and a second input terminal for receiving said received signal;

second mixer means for mixing said oscillator output signal for transmission with said received signal to produce a second mixer output signal, said second mixer means having a third input terminal for receiving said oscillator output signal for transmission and a fourth input terminal for receiving said received signal;

phase quadrature means operatively associated with said first and second mixer means so as to establish a phase quadrature relationship between said first and second mixer output signals; and

demodulator means for receiving and demodulating the first and second mixer output signals having the quadrature relationship therebetween so as to provide for contemporaneous

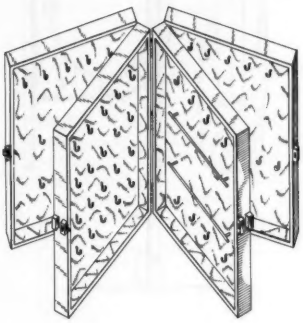
transmission and reception between more than two transmitter/receivers;

wherein said demodulator means comprises two band pass filters, each receiving a respective one of said first and second mixer output signals, and arranged to pass first and second baseband audio frequency signals, respectively, phase shift means operative at an audio frequency for imposing a differential phase shift of substantially 90° between the first and second baseband audio frequency signals from the said first and second filters to produce first and second phase shift output signals respectively, and combiner means for receiving and combining the first and second phase shift output signals, whereby to provide a demodulated output signal.

DESIGNS

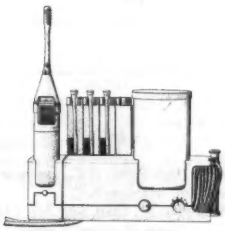
SEPTEMBER 14, 1982

266,115
JEWELRY BOX
James E. Glenn, Sr.; Gladys M. Glenn, and James E. Glenn, Jr., all of 6149 W. Oxford St., Philadelphia, Pa. 19151
Filed May 29, 1979, Ser. No. 43,523
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—75

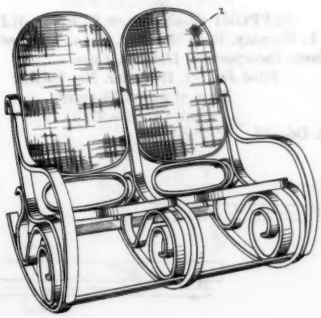


266,116
HAND BRUSH
Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation Societe Anonyme, Grenoble, France
Filed Nov. 23, 1979, Ser. No. 96,912
Claims priority, application France, May 22, 1979, 2525
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—13

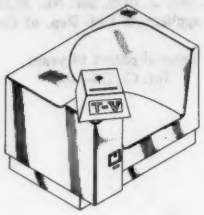
266,117
ELECTRIC TOOTHBRUSH AND HYDRAULIC JET CLEANER
Robert Oberheim, Liederbach, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed May 2, 1979, Ser. No. 35,184
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 8753
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15



266,118
DUAL ROCKER OR SIMILAR ARTICLE
Alan J. Wexler, Lake Success, N.Y., assignor to Astra Trading Corporation, New York, N.Y.
Filed Aug. 27, 1979, Ser. No. 70,159
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

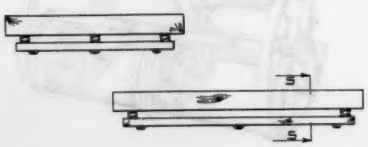


266,119
COMBINED CHAIR AND TELEVISION VIEWER
Reid S. Larsen, Bountiful, Utah, assignor to Midwest International, Inc., Salt Lake City, Utah
Filed Nov. 3, 1980, Ser. No. 203,158
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—64



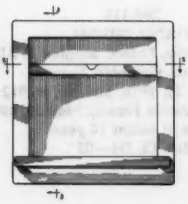
266,120
SEAT
Richard G. Brown, High Point, N.C., assignor to Null Manufacturing Corporation, Maiden, N.C.
Filed Feb. 27, 1980, Ser. No. 124,981
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

266,121
SUPPORT STAND FOR TURNTABLE
Robert L. Doughty, West Hartford, Conn., assignor to Whiting Products, Incorporated, Hamden, Conn.
Filed Jan. 11, 1980, Ser. No. 111,328
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

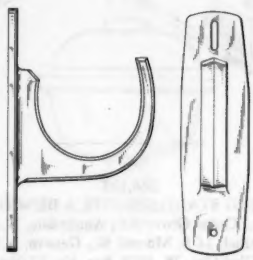


266,122
WALL RAIL FOR HAND SHOWERS
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed May 13, 1980, Ser. No. 149,375
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, MR 979 Ob
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86

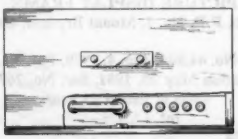
266,123
WALL MOUNTED BATHROOM ACCESSORY FIXTURE
Warren Alfano, N. 6324 Forest Blvd., Spokane, Wash. 99208
Filed Dec. 8, 1980, Ser. No. 213,890
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

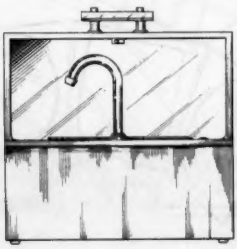


266,124
WALL HOOK
Mark E. Stankewich, 267 Stewart Ave., Garden City, N.Y. 11530
Filed Apr. 6, 1981, Ser. No. 251,274
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—120

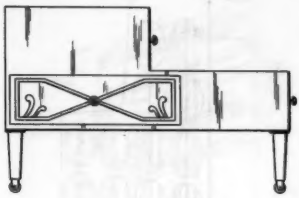


266,125
PORTABLE BAR
Lester Wolf, 5901 Feinston St., Hollywood, Fla. 33023
Filed Apr. 21, 1980, Ser. No. 142,357
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

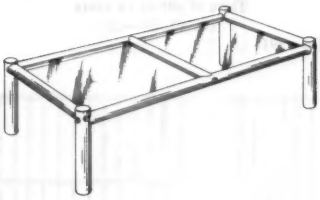




266,126
CABINET
Nadine Goodhart, 3753 Ave. 1, Space 14, Lancaster, Calif. 93534
Filed Mar. 12, 1979, Ser. No. 19,852
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169

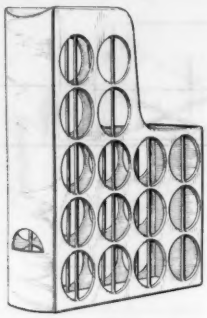


266,127
TABLE OR THE LIKE
Richard M. Chapin, Charlotte, N.C., assignor to Family Tree Furniture Company, Inc., Salisbury, N.C.
Filed Oct. 16, 1979, Ser. No. 85,309
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

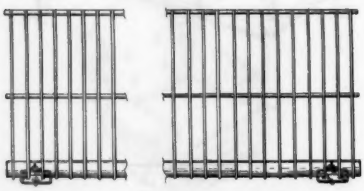


266,128
FOLDABLE TABLE FOR POWER TOOLS
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Sep. 24, 1980, Ser. No. 190,431
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

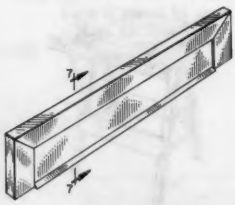
266,129
FILE FOR PERIODICALS
Anders Lidstrom, Fregattvagen 15, S-181 37 Lidingo, Sweden
Filed Jul. 15, 1980, Ser. No. 169,206
Claims priority, application Sweden, Jan. 15, 1980, 800075
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



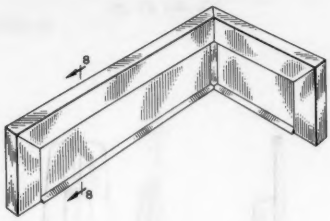
266,130
COMBINED SHELF AND GARMENT SUPPORT ROD
Cesare J. Gimmi, Oceanside, and Morton Fellman, Bayside, both of N.Y., assignors to F.C.F. Industries, Inc., Corona, N.Y.
Filed Apr. 27, 1979, Ser. No. 33,949
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



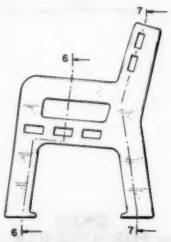
266,131
SPLASH RAIL FOR COUNTERTOP
Basil T. Kelley, 6139 SE. 103rd, Portland, Oreg. 97266
Filed Aug. 21, 1980, Ser. No. 180,096
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



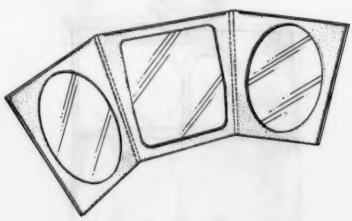
266,132
CORNER SPLASH RAIL FOR COUNTERTOP
Basil T. Kelley, 6139 SE. 103rd, Portland, Oreg. 97266
Filed Aug. 21, 1980, Ser. No. 180,165
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



266,133
END STANDARD FOR A BENCH
Otto Stahl, Jr., Cedar Grove Rd., Annandale, N.J. 08801, and William Koelbel, 14 S. Morrell St., Geneva, N.Y. 14456
Filed Oct. 25, 1979, Ser. No. 87,988
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

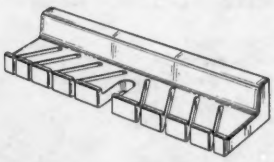


266,134
PICTURE DISPLAY FRAME
Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada N0L 1W0
Division of Ser. No. 44,844, Jun. 4, 1979, Pat. No. 261,585. This application May 28, 1981, Ser. No. 267,996
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

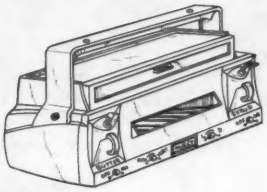


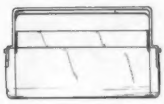
266,135
COVERED BOWL OR SIMILAR ARTICLE
Wayne Husted, Tiburon, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 11, 1979, Ser. No. 37,715
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17

266,136
KNIFE RACK
Lawrence Peabody, New York; Theodore W. Schriever, Syracuse, and Stephen K. Wenczl, Fayetteville, all of N.Y., assignors to Syroco, Inc., Syracuse, N.Y.
Filed Jul. 15, 1980, Ser. No. 169,062
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—74

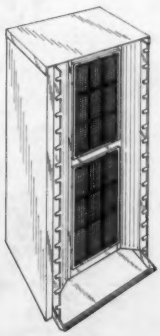


266,137
HANGING TOASTER UNIT
Eugene C. Schmidli, 136 Avery, Mt. Clemens, Mich. 48043
Filed Sep. 19, 1980, Ser. No. 188,621
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—91



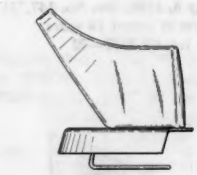


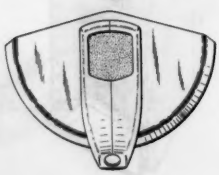
266,138
COOKING DEVICE
Lazar I. Albazi, 1623 N. Klein, Oklahoma City, Okla. 73106, and Sargon P. Jillo, Norman, Okla., assignors to Lazar I. Albazi, Oklahoma City, Okla.
Filed May 8, 1980, Ser. No. 147,731
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—110



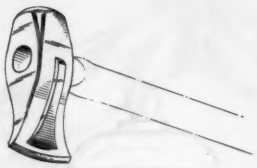
266,139
SPOON OR SIMILAR ARTICLE
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Aug. 14, 1980, Ser. No. 178,055
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

266,140
MOTOR HOUSING WITH INTEGRAL GUARD APRON FOR A GRASS CUTTER
Ruedi Fellmann, Dietlinkon, Switzerland, assignor to Max Langenstein Feld- Und Gartengeräte GmbH & Co., Illertissen, Fed. Rep. of Germany
Filed Mar. 17, 1980, Ser. No. 131,129
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, MR896
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8



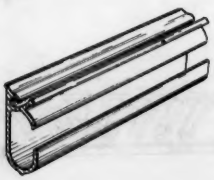


266,141
WOOD SPLITTING MAUL HEAD
Jack W. Nannen, 2712 Orchard La., Mount Penn, Pa. 19606
Filed Sep. 2, 1980, Ser. No. 183,288
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—76

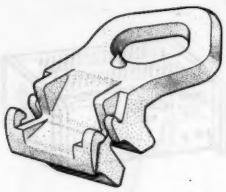


266,142
SUSPENSION ARM FOR SUPPORTING A LOAD SUCH AS A WIRE OR CABLE
Karl B. Sikstrom, Lilla Gransgatan 2, S-971 00 Malmberget, Sweden
Filed Mar. 13, 1980, Ser. No. 130,041
Claims priority, application Sweden, Sep. 17, 1979, 79-2050
Term of patent 7 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

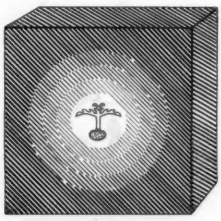
266,143
CURTAIN TRACK SECTION
Ivan A. Smith, Cheltenham, Australia, assignor to Village Nominees Pty. Ltd., Australia
Filed Jul. 22, 1980, Ser. No. 171,154
Claims priority, application Australia, Feb. 7, 1980, 80,204
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—377



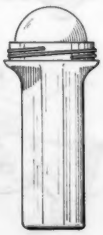
266,144
PUSH LOCK HANGER FOR SHALLOW CHANNEL METAL FRAME
Robert S. Wallace, Los Angeles, Calif., assignor to Dan F. Wallace, Karlua-Kona, Hi.
Filed Jul. 21, 1980, Ser. No. 170,953
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



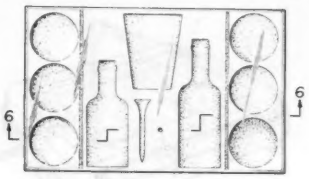
266,145
BOX
Yasuji Sayama, Yokohama, Japan, assignor to Mannan Foods Kabushiki Kaisha, Japan
Filed Sep. 19, 1980, Ser. No. 188,882
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—335



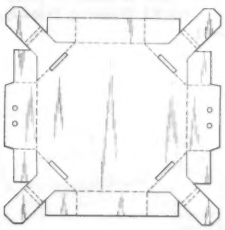
266,146
DISPENSING CONTAINER
Edward Morris, Paramus, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 2, 1980, Ser. No. 183,684
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—338



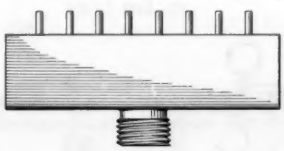
266,147
COMPARTMENTED PACKAGING CONTAINER
William R. McIntosh, 2300 NW. 78th Ave., and John R. McIntosh, 8721 NW. 24th Ct., both of Sunrise, Fla. 33322
Filed Oct. 4, 1979, Ser. No. 81,942
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345



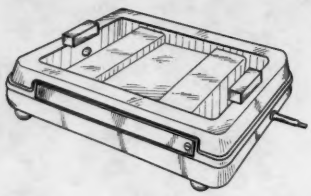
266,148
CARTON LID BLANK OR THE LIKE
Roger M. Floyd, Monroe, La., assignor to Manville Forest Products Corporation, West Monroe, La.
Filed Jul. 25, 1980, Ser. No. 172,050
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



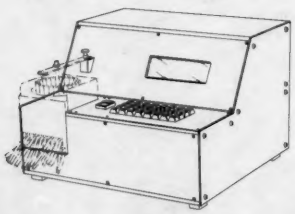
266,149
DISPENSING CAP FOR A CONTAINER
David Charlton, Toronto, and David MacMorine, Mississauga, both of Canada, assignors to Ortho Pharmaceutical (Canada) Ltd., Don Mills, Canada
Filed Aug. 21, 1980, Ser. No. 180,208
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—436



266,150
HOUSING FOR AN ELECTROPHORESIS APPARATUS OR SIMILAR ARTICLE
Janos Borsos, Budapest, Hungary, assignor to Labor Müszeripari Müvek, Esztergom, Hungary
Filed Jan. 24, 1979, Ser. No. 5,997
Claims priority, application Hungary, Nov. 21, 1978, 78638
Term of patent 14 years
Int. Cl. D10—*04;* D24—*01*
U.S. Cl. D10—81

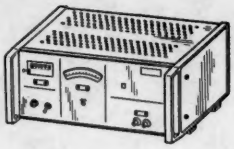


266,151
FRACTION COLLECTOR FOR LIQUID CHROMATOGRAPHY
Donald Dawson, Mt. Laurel, N.J., assignor to Siemens Corporation, Iselin, N.J.
Filed Feb. 28, 1980, Ser. No. 125,686
Term of patent 14 years
Int. Cl. D10—*04;* D24—*01*
U.S. Cl. D10—81



266,152
SCALE
Jose Oswald, 110 Plum Tree, Wilmette, Ill. 60091
Filed Sep. 11, 1980, Ser. No. 186,284
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—90

266,153
ULTRASONIC FLOWMETER
Alexandr D. Suslov, ulitsa Eniseiskaya, 4, kv. 12; Eduard A. Zalessky, ulitsa Tashkentskaya, 130, kv. 11; Vladimir V. Smyshlyaev, ulitsa Michurina, 116, kv. 57; Klavdia N. Alexandrova, 13 proezd, 33, kv. 52, and Raisa P. Demina, Zubchaninovskoe shosse, 169/9, kv. 84, all of Kuibyshev, U.S.S.R.
Filed Aug. 23, 1979, Ser. No. 69,759
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

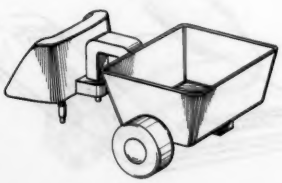


266,154
JEWELRY PENDANT
Hovannes J. Zaboyan, Warwick, R.I., assignor to National Chain Company, Warwick, R.I.
Filed Aug. 11, 1980, Ser. No. 177,351
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

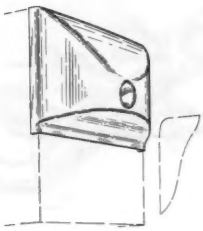
266,155
PENDANT
Sherman Scherenberg, Jr., 102 S. 50th, Bellwood, Ill. 60104
Filed Sep. 15, 1980, Ser. No. 187,182
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83

266,156
COMBINED ICE FISHING HUT AND SLED
Arnold G. Ebner, 69205 Garver Lake Rd., Edwardsburg, Mich. 49112; Leonard W. Kline, 25107 Pin Oak Dr., South Bend, Ind. 46614, and Rudolph C. Yakym, 2633 Castine Walk, Mishawaka, Ind. 46544
Filed Jun. 3, 1980, Ser. No. 156,057
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—6

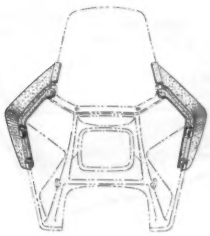
266,157
COMBINED TRICYCLE TRAILER AND BACKREST-HITCH
Robert J. Rosadini, 62 Willow Ridge Rd., North Andover, Mass. 01845
Filed Jun. 25, 1980, Ser. No. 162,756
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



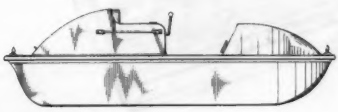
266,158
AERODYNAMIC DRAG REDUCING FAIRING
Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405
Filed Dec. 8, 1980, Ser. No. 213,839
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



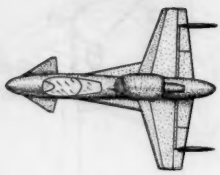
266,159
PAIR OF MOTORCYCLE FAIRING BODY EXTENDERS
Randall K. Johnson, Morro Bay; Kenneth W. Cummings, San Luis Obispo, and Charles M. Perethian, Santa Margarita, all of Calif., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Jun. 9, 1980, Ser. No. 157,334
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



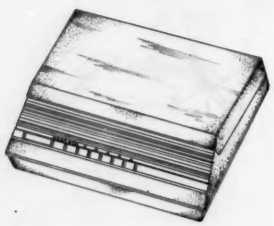
266,160
BOAT
Urban W. Simon, R.R. #1, C51, Council Grove, Kans. 66846, and Gene L. Simon, 1800 W. 26th St., Topeka, Kans. 66611
Filed Jun. 23, 1980, Ser. No. 161,898
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—310

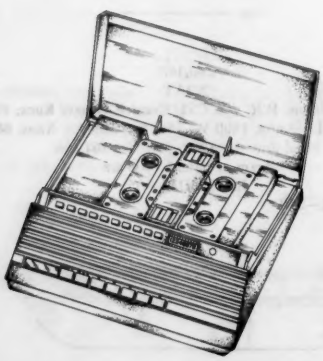


266,161
AIRCRAFT
Gordon Rosenthal, Jericho, N.Y., assignor to Fairchild Industries, Inc., Germantown, Md.
Filed Oct. 1, 1979, Ser. No. 80,801
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—332

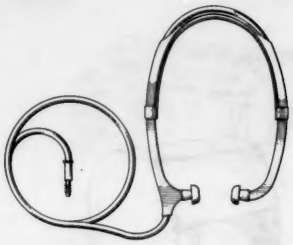


266,162
TELEPHONE ANSWERING UNIT
Arthur T. Martinez, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.
Filed Oct. 30, 1980, Ser. No. 202,333
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—4

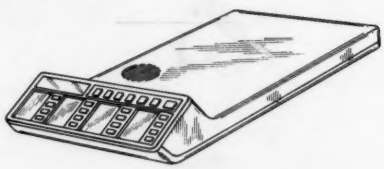




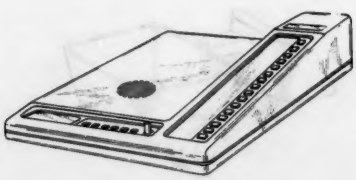
266,163
PNEUMATIC HEADSET
Robert A. Moussette, 9C, Chinachem Commercial Centre, 272 Chatham Rd., Kowloon, Hong Kong
Filed Jun. 11, 1980, Ser. No. 158,583
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36



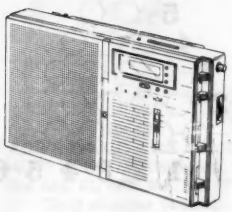
266,164
AUTOMATIC DIALING APPARATUS FOR TELEPHONE
Kenji Nakamura, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Jun. 13, 1980, Ser. No. 159,433
Claims priority, application Japan, Feb. 20, 1980, 55-6368; Feb. 20, 1980, 55-6369
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



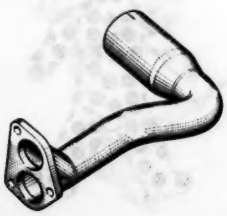
266,165
AUTOMATIC DIALING APPARATUS FOR TELEPHONE
Kenji Nakamura, and Miwaji Ikeya, both of Aichi, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jun. 13, 1980, Ser. No. 159,434
Claims priority, application Japan, Dec. 24, 1979, 54-54559
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66



266,166
CLOCK RADIO
Masanori Hamada, Yao; Keizo Kushida, Fujiidera, and Kikuo Ohta, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 30, 1979, Ser. No. 99,128
Claims priority, application Japan, May 31, 1979, 54-22460
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—70

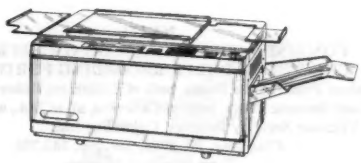


266,167
AUTOMOBILE MANIFOLDS
Benny Lindbrandt, Tidaholmsvägen 37A, 121 48 Johanneshov, Sweden
Filed May 22, 1980, Ser. No. 152,503
Claims priority, application Sweden, Nov. 30, 1979, 792642
Term of patent 14 years
Int. Cl. D15—*1*
U.S. Cl. D15—5



266,168
AUTOMOBILE MANIFOLDS
Benny Lindbrandt, Tidaholmsvägen 37A, 121 48 Johanneshov, Sweden
Filed May 22, 1980, Ser. No. 152,504
Claims priority, application Sweden, Nov. 30, 1979, 792642
Term of patent 14 years
Int. Cl. D15—*1*
U.S. Cl. D15—5

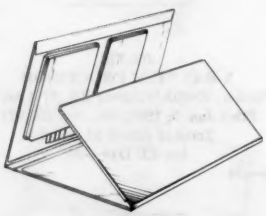
266,169
ELECTRONIC COPYING MACHINE
Shigeki Yasutani, Kashiwa, and Kunio Hara, Chiba, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Apr. 15, 1980, Ser. No. 140,588
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



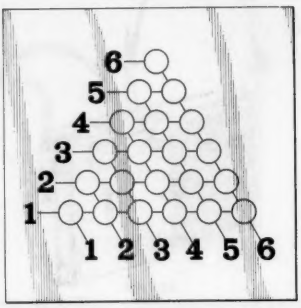
266,170
X-RAY FILM PROCESSOR
Warren G. Fischer, 4N003 Wildrose Rd., St. Charles, Ill. 60174
Filed Jun. 9, 1980, Ser. No. 157,971
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—34

266,171
GUITAR OR SIMILAR ARTICLE
Bruce M. Lehto, 20424 Inkster Rd., Redford, Mich. 48240
Filed Jun. 30, 1980, Ser. No. 164,809
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—19

266,172
COMBINED CHECKING ACCOUNT CHECK AND CHECKBOOK ORDER RECORDING PORTFOLIO
Robert Fraser; John Rouse, both of Baltimore; Robert C. Redic, and Suzanne Frock, both of Columbia, all of Md., assignors to Falconer Security Printers, Columbia, Md.
Filed Aug. 29, 1980, Ser. No. 182,756
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



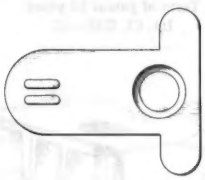
266,173
GAME BOARD
Michael H. Saint Ive, Englewood, Colo., assignor to Lagess Corp., Englewood, Colo.
Filed Jun. 27, 1979, Ser. No. 52,617
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



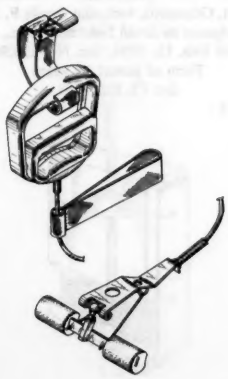
266,174
TOY BEAR
Tara A. Amato, Long Beach, N.Y., assignor to ATC Greeting Card Co., Atlantic Beach, N.Y.
Filed Jun. 4, 1979, Ser. No. 44,848
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—159

266,175
SPACE CREATURE NOVELTY FIGURE
Barbara Zachar, 324 Warbutron Ave., Hastings-on-Hudson, N.Y. 10706
Filed Jun. 17, 1980, Ser. No. 160,209
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

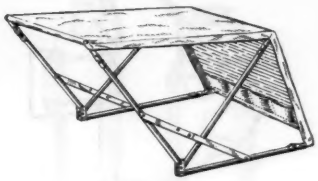
266,176
TEE FOR A PROJECTILE GAME PIECE
Les W. Thomes, 337 E. 40th St., Covington, Ky. 41015
Filed Aug. 11, 1980, Ser. No. 177,019
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—209



266,177
BRAKE FOR ROLLER SKATE OR THE LIKE
Dennis D. Riggs, 415 Pile St., Ramona, Calif. 92065
Filed Oct. 17, 1980, Ser. No. 197,930
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226



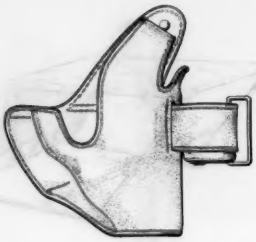
266,178
TENT
John F. Lotterer, 23812 Via La Coruna, Mission Viejo, Calif. 92675
Filed Jun. 20, 1980, Ser. No. 161,554
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253



266,179
ARROW REST FOR ARCHERY BOW
Paul L. Peck, Box 427, Bryantville, Mass. 02327
Filed Jul. 7, 1980, Ser. No. 166,110
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—5

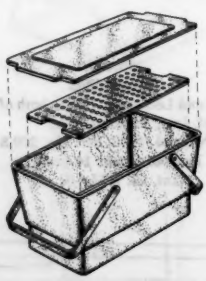
266,180
GUN SLING
Jane H. Dickinson, and Leebert D. Clark, both of Yoakum, Tex., assignors to Torel, Inc., Yoakum, Tex.
Filed Nov. 24, 1980, Ser. No. 209,864
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

266,181
PISTOL HOLSTER
Morris C. Fry, Frederick, Md., assignor to Tandy Brands, Inc., Fort Worth, Tex.
Filed Oct. 24, 1980, Ser. No. 200,212
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

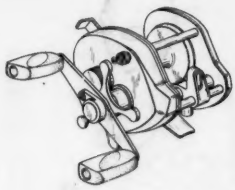


266,182
FLY SWATTER
James M. Borer, 419 Webster Ave., North Mankato, Minn. 56001
Filed Nov. 17, 1980, Ser. No. 207,403
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20

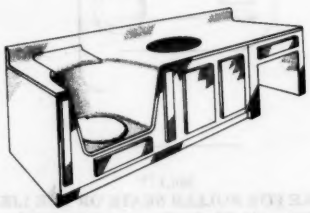
266,183
FISH BAIT KEEPING CONTAINER
James R. Snow, 2038 Majestic Way, San Jose, Calif. 95132
Filed Jun. 16, 1980, Ser. No. 159,674
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



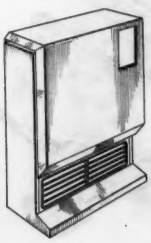
266,184
FISHING REEL
Kanji Iinuma, and Hideo Nakamura, both of Kaganei, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Sep. 5, 1980, Ser. No. 184,628
Claims priority, application Japan, Mar. 22, 1980, 55-11090
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



266,185
COMBINED WATER CLOSET COVER AND BATHROOM CABINET
Michael Adamcik, 357 Lakeview Dr., North Fort Myers, Fla. 33903
Division of Ser. No. 927,899, Jul. 25, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,342
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



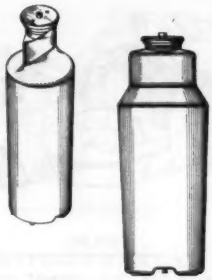
266,186
HEATER
Amos E. Chesnut, Columbus, Ind., and James F. Mariol, Cincinnati, Ohio, assignors to Arvin Industries, Inc., Columbus, Ind.
Filed Feb. 15, 1980, Ser. No. 123,969
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—92



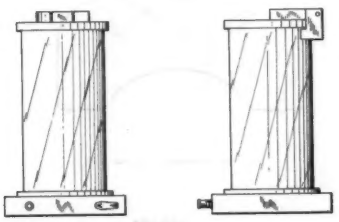
266,187
STOVE WITH CERAMIC TILE INSERTS
Dennis G. Key, 85776 Loraine Hwy., Eugene, Oreg. 97402
Filed Dec. 1, 1980, Ser. No. 212,840
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

266,188
TOOTH SIZE AND FORM INDICATOR
Wayne C. Seeley, York, and Richard A. Smith, New Freedom, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.
Filed Nov. 23, 1979, Ser. No. 97,102
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—10

266,189
PLASMA TRANSFER BOTTLE
Albert Safianoff, Rancho Palos Verdes, Calif., assignor to Alpha Therapeutic Corp., Los Angeles, Calif.
Filed Aug. 29, 1980, Ser. No. 182,452
Term of patent 14 years
Int. Cl. 24—*99*
U.S. Cl. D24—56

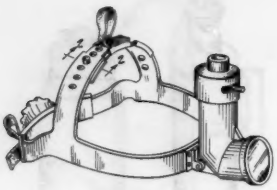


266,190
VACUUM CONTAINER FOR PARENTERAL FLUIDS OR THE LIKE
Yves Herman, Ath, Belgium, assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jun. 13, 1980, Ser. No. 159,273
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—99

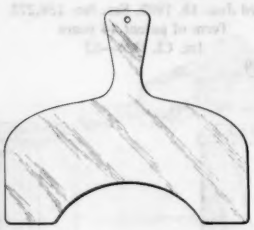


266,191
BUILDING
Victor J. Cassano, Sr., and Howard J. Neff, Sr., both of Dayton, Ohio, assignors to Cassano's Inc., Dayton, Ohio
Filed Nov. 28, 1979, Ser. No. 97,922
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

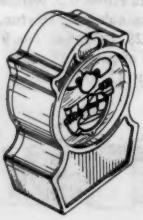
266,192
SURGICAL HEADLIGHT OR SIMILAR ARTICLE
Richard E. Feinbloom, New York, and Laszlo Endrodi, Jackson Heights, both of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Dec. 20, 1979, Ser. No. 105,729
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—39



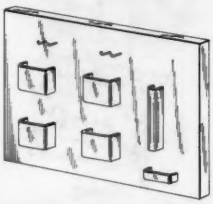
266,193
FACE SHIELD FOR HAIRDRESSERS
Peter G. Ivone, 39 Greenville Ave., Johnston, R.I. 02919
Filed Jul. 7, 1980, Ser. No. 166,673
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—9



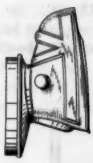
266,194
DENTAL FLOSS DISPENSER
Rodney J. Graves, 17619 N. 35th Pl., Phoenix, Ariz. 85032
Filed Jul. 17, 1980, Ser. No. 169,925
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D28—64



266,195
HAIR CARE TOOL HOLDER
Robert A. Bennett, 128 113th La. Northeast, Blaine, Minn. 55434
Filed Oct. 1, 1979, Ser. No. 80,579
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—73



266,196
RESPIRATION MASK
Per O. Sundström, Lidingö, Sweden, assignor to Sunströms Respiratorer AB, Sweden
Filed Mar. 4, 1980, Ser. No. 127,155
Claims priority, application Sweden, Oct. 19, 1979, 792319
Term of patent 14 years
Int. Cl. D29—*02*; D24—*02*
U.S. Cl. D29—8

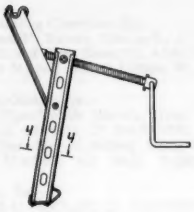


266,197

MOTOR VEHICLE JACK

Graham H. Colton, Rise Park, England, assignor to Metallifacture Limited, Redhill, England

Filed Dec. 10, 1979, Ser. No. 101,430
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—31

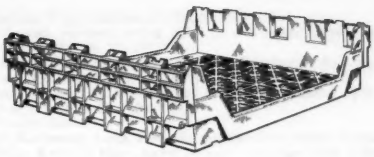


266,198

BAKERY TRAY OR SIMILAR ARTICLE

James C. Carroll, and Lewis T. Johnson, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 5, 1980, Ser. No. 156,707
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D34—40



266,199

RECEPTACLE WITH LOCK

Robert L. Schattner, Marlton, N.J., and Allen S. Schattner, Pittsburgh, Pa., assignors to Omnimed, Inc., Maple Shade, N.J.

Filed Jul. 3, 1980, Ser. No. 165,575
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D99—28

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Lehnhardt, William F.; Streaty, Charles E., Jr.; Yackel, Walter C., Jr.; Yang, Ho S.; and Tang, Daniel K., 4,349,576, Cl. 426-582.000.
Wright, Kenneth N.; and Griffel, Gilbert W., Jr., 4,349,578, Cl. 426-630.000.

A. Nattermann & Cie GmbH: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,349,684, Cl. 548-320.000.
Lautenschlager, Hans-Heiner; Betzing, Hans; Winkelmann, Johannes; Probst, Manfred; and Stoll, Brigitte, 4,349,686, Cl. 549-69.000.

AB Bonnierforetagen: *See*—
Gustafsson, Berth U., 4,348,865, Cl. 60-493.000.

AB Karlstads Mekaniska Werkstad: *See*—
Stenberg, Erik G., 4,349,414, Cl. 162-123.000.

Abbott Laboratories: *See*—
Gross, James R., 4,349,023, Cl. 128-214.400.

Abe, Masaru: *See*—
Tsurunaga, Yasuaki; Abe, Masaru; Hashimoto, Hideaki; and Tsuzura, Junichi, 4,349,062, Cl. 152-356.00R.

Abelitis, Andris, to Klockner-Humboldt-Deutz AG. Method for calcining fine-grained material, particularly for the manufacture of cement clinker. 4,349,387, Cl. 106-100.000.

Abeta, Sadaharu: *See*—
Nakatsuka, Kiyoharu; and Abeta, Sadaharu, 4,349,349, Cl. 8-527.000.

Abmayr, David W.: *See*—
Morgan, Barrie O.; and Abmayr, David W., 4,349,695, Cl. 178-22.080.

ACF Industries, Inc.: *See*—
Randolph, Robert W., 4,348,964, Cl. 105-42.00D.

Acharya, Seetharama A.: *See*—
Manning, James M.; and Acharya, Seetharama A., 4,349,352, Cl. 23-230.00B.

Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, to Ciba-Geigy Corporation. Dihalovinylcyclopropanecarboxylic acid esters and their use in pest control. 4,349,567, Cl. 424-305.000.

Ackley, Donald E., to Hewlett-Packard Company. Tapered stripe semiconductor laser. 4,349,905, Cl. 372-46.000.

Acme Burgess, Inc.: *See*—
Beiswenger, John L.; and Smiesko, Frank A., 4,349,157, Cl. 239-509.000.

Adam, Habil G.: *See*—
Lischewski, Manfred; Adam, Habil G.; and Serebryakov, Edward P., 4,349,481, Cl. 549-297.000.

Adams, Alfred A., to Crystic Systems Limited. Adhesive tapes. 4,349,599, Cl. 428-233.000.

Adams, Keith J. G.; Brightwell, Alan; Price, Barry L.; Pegler, Stuart M.; and Weall, Paul, to British Gas Corporation. Testing circuit for fuel burner controls. 4,349,745, Cl. 307-12.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Nakahara, Yutaka; and Haruna, Tohru, 4,349,468, Cl. 524-302.000.

Adelmann, John C.: *See*—
Trainor, James T.; Covaleski, Stanley F.; and Adelmann, John C., 4,349,595, Cl. 428-64.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Pfeifer, Josef; Paulus, Rudolf; and Zieran, Eberhard, 4,349,730, Cl. 235-472.000.
Sobel, Johannes; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,349,624, Cl. 430-622.000.

Aharoni, Shaul M., to Allied Corporation. Polyester compositions containing sodium nitrite. 4,349,503, Cl. 264-328.160.

AHK Alkohol Handelskontor GmbH: *See*—
Schuster, Wilhelm; Stahl, Jurgen; and Wegner, Wilhelm, 4,349,134, Cl. 222-212.000.

Aisin Seiki Company, Limited: *See*—
Tsujio, Hisami, 4,349,093, Cl. 192-107.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Ochiai, Chiaki, 4,348,944, Cl. 91-369.00A.
Toyoda, Minoru, 4,348,880, Cl. 70-456.00R.
Toyoda, Minoru, 4,348,881, Cl. 70-456.00R.

Aisin-Warner Kabushiki Kaisha: *See*—
Ito, Takayoshi; Kubo, Seitoku; and Terakura, Yukio, 4,349,088, Cl. 192-3.300.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece with error compensation circuit. 4,349,900, Cl. 368-187.000.

Aizawa, Tatsuo: *See*—
Miyakawa, Nobuhiro; and Aizawa, Tatsuo, 4,349,611, Cl. 428-500.000.

Akademie der Wissenschaften der DDR: *See*—
Lischewski, Manfred; Adam, Habil G.; and Serebryakov, Edward P., 4,349,481, Cl. 549-297.000.

Akagi, Jiro, to Kabushiki Kaisha Komatsu Seisakusho. Accumulator type fuel injection apparatus. 4,349,152, Cl. 239-96.000.

Akehurst, Douglas J., to Duraplug Electricals Limited. Electric switches. 4,349,814, Cl. 340-679.000.

Akita, Yoshio: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.

Akitake, Isao; Noda, Tsutomu; and Yamazaki, Kazuhiko, to Hitachi, Ltd. AM Stereophonic demodulator circuit for amplitude/angle modulation system. 4,349,696, Cl. 179-1.0GS.

Akizuki, Kunio: *See*—
Koyama, Yukio; Kondo, Tsutomu; Matsuzaki, Mikio; and Akizuki, Kunio, 4,349,247, Cl. 350-302.000.

Akkerman, Neil H.; and Foster, Stephen R., to Baker CAC, Inc. Valve actuator having a continuously charged accumulator. 4,349,175, Cl. 251-31.000.

Aktiebolaget IRO: *See*—
Carlsson, Eric; and Wide, Lars, 4,349,161, Cl. 242-47.010.

Albert Obrist AG: *See*—
Obrist, Albert; and Breuer, Hans-Werner, 4,349,174, Cl. 249-58.000.
Obrist, Albert; Blaesi, Max; and Auer, Serge, 4,349,399, Cl. 156-86.000.

Albert, Orrin W., Jr., to United States of America, Navy. In-flight hydrophone deployment system for underwater vehicles. 4,349,292, Cl. 403-322.000.

Alcan Aluminum Corporation: *See*—
Wollam, Carl A.; and Gailey, Lynn, 4,348,849, Cl. 52-545.000.

Alferness, Clifton A., to Physio-Control Corporation. Manually-actuable CPR apparatus. 4,349,015, Cl. 128-28.000.

Alfranseder, Josef: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Schaffelhofer, Iwo, 4,349,417, Cl. 203-33.000.

Allen Engineering Corporation: *See*—
Allen, J. Dewayne, 4,349,294, Cl. 404-110.000.
Allen, J. Dewayne, 4,349,328, Cl. 425-456.000.

Allen, J. Dewayne, to Allen Engineering Corporation. Concrete topping spreader system. 4,349,294, Cl. 404-110.000.

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Allen, Wesley H. Internal combustion engine fuel treatment apparatuses and process. 4,349,002, Cl. 123-557.000.

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Hamlyn, Maxwell C., 4,349,501, Cl. 264-210.300.

Allied Corporation: *See*—
Aharoni, Shaul M., 4,349,503, Cl. 264-328.160.
Belsky, Stephen E.; and Mathew, Chempolil T., 4,349,418, Cl. 203-45.000.
Bonfield, John H.; Sifniades, Stylianos; and Ulmer, Harry E., 4,349,520, Cl. 423-387.000.
Khattab, Ghazi M. A., 4,349,421, Cl. 204-38.00B.

Allison, Clint, to Hager and Allison Corp. Cooking apparatus. 4,348,948, Cl. 99-339.000.

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Baldi, Alfonso L., 4,349,612, Cl. 428-607.000.

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Altmann, Garhard; and Pfeiffer, Richard, to Transformatoren Union AG. Single-phase transformer with windings cast in casting resin. 4,349,801, Cl. 336-84.00C.

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Stewart, Donald L., Jr., 4,349,420, Cl. 203-75.000.

Alvarez-Sabater, Fernando; and Ulivi C., Ilio J. Cassette rotary tray slide projector and slide cassette usable therewith. 4,349,253, Cl. 353-112.000.

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Amano, Muneyuki; and Sasaki, Yasuo, to National Research Institute for Metals. Iron-titanium-niobium alloy. 4,349,527, Cl. 423-644.000.

American Cyanamid Company: *See*—
Arendt, Volker D.; and Li, Tsi T., 4,349,656, Cl. 528-63.000.
Brown, Dale G., 4,349,553, Cl. 424-251.000.
American Home Products Corporation: *See*—
Freed, Elisabeth H., deceased; Wei, Peter H. L.; and McCaully, Ronald J., 4,349,674, Cl. 544-353.000.
American Science and Engineering, Inc.: *See*—
Annis, Martin, 4,349,739, Cl. 378-99.000.
Ammon, Robert L.: *See*—
Lu, Wen-Tong P.; and Ammon, Robert L., 4,349,428, Cl. 204-294.000.
Amneus, John S., to Procter & Gamble Company, The. Portable, measured volume dispenser. 4,349,129, Cl. 222-41.000.
AMP Incorporated: *See*—
Cobaugh, Robert F.; and Graeff, Norwood C., 4,349,237, Cl. 339-65.000.
Roberts, Lincoln E.; and Wasserlein, Henry G., Jr., 4,349,239, Cl. 339-97.00R.
Showman, Robert L.; and Yeager, Patrick F., 4,349,238, Cl. 339-75.00M.
Ampex Corporation: *See*—
Gallo, Luigi C., 4,349,832, Cl. 358-8.000.
Analog Devices, Incorporated: *See*—
Brokaw, Adrian P., 4,349,811, Cl. 340-347.0DA.
Andersson, Leif H., to Facit Aktiebolag. Assembly for moving printing means of a printing machine. 4,349,284, Cl. 400-320.000.
Ando, Haruhisa: *See*—
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Andreas Stihl: *See*—
Dolata, Hans; Meyle, Werner; and Weyda, Gunther, 4,348,926, Cl. 83-833.000.
Andrews, Lawrence F.: *See*—
Webb, David E.; and Andrews, Lawrence F., 4,349,334, Cl. 433-9.000.
Androff, Joel W., to Carrier Corporation. Transport refrigeration machine. 4,348,871, Cl. 62-239.000.
Angelo, Lawrence F.; Bryant, Frank A.; and McLain, John D., to WellTech, Inc. Apparatus for elevating a mobile rig. 4,348,780, Cl. 14-1.000.
Angleboard Inc.: *See*—
Liebel, Henry L.; and Krier, Martin, 4,349,303, Cl. 410-154.000.
Annis, Martin, to American Science and Engineering, Inc. Micro-calcification detection. 4,349,739, Cl. 378-99.000.
Antipol Commercial Systems (Jersey) Limited: *See*—
Sejournant, Francine, 4,349,586, Cl. 427-154.000.
Antoni, Heinz: *See*—
Kluth, Manfred; Antoni, Heinz; and Stich, Werner, 4,348,909, Cl. 73-863.210.
Aoki, Harumi: *See*—
Jyojiki, Masao; and Aoki, Harumi, 4,349,254, Cl. 354-25.000.
Aoki, Hatsuo: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Aoki, Kanemasa, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Flat type coreless rotary electric machine. 4,349,761, Cl. 310-266.000.
Aoki, Masakazu: *See*—
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.
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Shimizu, Jozo; Yamaguchi, Satoru; and Aoyama, Shigeo, 4,349,608, Cl. 428-413.000.
Apeldoorn, Hans J.; and Tryzna, Miloslav, to U.S. Philips Corporation. Television receiver for receiving a picture carrier whose amplitude is modulated with a video signal, and a sound carrier whose frequency is modulated with an audio signal. 4,349,842, Cl. 358-197.000.
Arabian, Sandro, to Europtool Trust. Apparatus for dosing and forming soap foam. 4,349,131, Cl. 222-135.000.
Aratani, Matsuhiko: *See*—
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Arbed S.A.: *See*—
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; and Lorang, Lucien, 4,349,382, Cl. 75-60.000.
Arbeiter, Erich: *See*—
Nolte, Albert; Schleiermacher, Herbert; and Arbeiter, Erich, 4,348,990, Cl. 123-41.120.
Archer, Donald H.: *See*—
Bixler, Stephen D.; Thomas, David T.; and Archer, Donald H., 4,349,827, Cl. 343-786.000.
Arendt, Volker D.; and Li, Tsi T., to American Cyanamid Company. Thiodiethanol based polyurethane elastomers having improved dynamic properties and method for production thereof. 4,349,656, Cl. 528-63.000.
ARES, Inc.: *See*—
Gillum, Richard R., 4,348,938, Cl. 89-33.0BA.
Arikawa, Hiroo, to San-O Industrial Co., Ltd. Quick-acting micro-fuse. 4,349,805, Cl. 337-255.000.
Arippol, Raimondo. Method and apparatus for rapid drying of container covers. 4,348,816, Cl. 34-13.000.
Aristoff, Paul A., to Upjohn Company, The. Methano carbacyclin analogs. 4,349,689, Cl. 560-117.000.
Armstrong Cork Company: *See*—
Finney, Cecil H., 4,349,089, Cl. 192-4.00A.
Arnold, Erwin: *See*—
Gut, Edwin; Arnold, Erwin; Maugweiler, Gottfried; and Friedli, Hans, 4,349,231, Cl. 299-69.000.
Arnold, Niklaus; Schmidli, Josef; and Spiess, Peter, to BBC Brown, Boveri & Company, Ltd. Commutator for electrical machines. 4,349,759, Cl. 310-233.000.
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, to Nippon Telegraph & Telephone Public Corporation; and Hitachi, Ltd. Speech synthesizer. 4,349,699, Cl. 179-1.0SM.
Asahi Glass Company, Ltd.: *See*—
Ogawa, Hiroyuki; and Kaki, Haruhiko, 4,349,304, Cl. 414-106.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,349,627, Cl. 435-108.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Jyojiki, Masao; and Aoki, Harumi, 4,349,254, Cl. 354-25.000.
Kurei, Hiroshi, 4,349,261, Cl. 354-152.000.
Asahi, Taro: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, to Permelec Electrode Ltd. Method for forming an anticorrosive coating on a metal substrate. 4,349,581, Cl. 427-34.000.
Asano, Mitsuru: *See*—
Naito, Junichiro; Yamamoto, Shinichi; Suzuki, Jitsuo; and Asano, Mitsuru, 4,349,329, Cl. 425-461.000.
Aschwanden, Werner: *See*—
Kyburz, Emilio; and Aschwanden, Werner, 4,349,562, Cl. 424-274.000.
Ashdown, Barbara P.: *See*—
Ashdown, Raymond G.; and Ashdown, Barbara P., 4,348,807, Cl. 30-123.600.
Ashdown, Raymond G.; and Ashdown, Barbara P. Peeling device. 4,348,807, Cl. 30-123.600.
Asher, James C., to Atari, Inc. Joystick control. 4,349,708, Cl. 200-6.00A.
Asher, Lynn E.; and Conway, Antony J. End or corner fence post construction. 4,349,181, Cl. 256-35.000.
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., to Veeder Industries Inc. Liquid level measuring system. 4,349,882, Cl. 364-509.000.
Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines): *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,348,980, Cl. 118-717.000.
Atari, Inc.: *See*—
Asher, James C., 4,349,708, Cl. 200-6.00A.
Atkinson, Joseph G.; Baldwin, John J.; and McClure, David E., to Merck & Co., Inc.; and Merck Sharp & Dohme Corp. Benzoxazines. 4,349,673, Cl. 544-105.000.
Atlas Copco Aktiebolag: *See*—
Henriksson, Stig R., 4,349,075, Cl. 173-134.000.
Atron, Inc.: *See*—
Savard, Hassel J., Jr., 4,349,127, Cl. 221-196.000.
Atsugi Motor Parts Co., Ltd.: *See*—
Sekiguchi, Tomoyoshi; and Ishikawa, Hiroya, 4,349,077, Cl. 180-41.000.
Audi NsU Auto Union Aktiengesellschaft: *See*—
Leitermann, Wulf; and Pflugfelder, Karl, 4,348,915, Cl. 74-473.00R.
Auer, Serge: *See*—
Obrist, Albert; Blaesi, Max; and Auer, Serge, 4,349,399, Cl. 156-86.000.
Australasian Training Aids, Pty., Ltd.: *See*—
Knight, Lindsay C., 4,349,729, Cl. 235-400.000.
Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, 4,349,728, Cl. 235-400.000.
Avco Corporation: *See*—
Libertini, Zoltan L.; and Ivanko, Theodore, 4,349,318, Cl. 416-220.00R.
Avramidis, Stellios A.: *See*—
Stephanoff, Louis J.; and Avramidis, Stellios A., 4,349,343, Cl. 474-245.000.
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; and Mataev, Arkady R. Apparatus for electrochemical purification of contaminated liquids. 4,349,431, Cl. 204-302.000.
Axenko, Alexandr A.: *See*—
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Ayotte, Gary A.; Boh, Jules J.; and Breen, Thomas G., to Coulter Electronics, Inc. Slide holder for spinner. 4,349,275, Cl. 356-36.000.

B.A.T. Cigaretten-Fabriken GmbH: *See—*
Lorenz, Hans-Walther; Schumacher, Gerd; and Kirchner, Helmut, 4,348,887, Cl. 73-23.000.
B. F. Goodrich Company, The: *See—*
Doljack, Frank A., 4,349,883, Cl. 364-551.000.
Holloway, John A., 4,349,657, Cl. 528-66.000.
Stickler, John M.; and Shook, George L., 4,348,891, Cl. 73-81.000.
Baasner, Dietmar: *See—*
Brand, Wilhelm; and Baasner, Dietmar, 4,348,811, Cl. 33-125.00R.
Bachler, Anton R. Tracking or grading unit for ski-trails and paths. 4,348,825, Cl. 37-222.000.
Bachmann, Rainer; and Ulm, Helmut, to Black & Decker Inc. Cutting blade assembly for a power planer. 4,349,057, Cl. 144-230.000.
Baecklund, Nils J. Method of measuring the content of given element in a sample by means of X-ray radiation. 4,349,738, Cl. 378-49.000.
Bain, Benjamin H., Jr., to General Electric Company. Appliance strain relief. 4,349,240, Cl. 339-103.00R.
Bain, Kenneth J. D.; King, Dennis E.; Worship, Lesley A.; and Burton, Achmat T., to Marsden (Proprietary) Limited. Transport and storage bins. 4,349,117, Cl. 220-4.00F.
Bair, Scott S., to Woolfolk Chemical Works, Inc. Liquid metering pump. 4,349,130, Cl. 222-129.200.
Baird Corporation: *See—*
Kliman, Arthur W., 4,349,245, Cl. 350-264.000.
Bajorek, Christopher H.; Chance, Dudley A.; and Ho, Chung W., to International Business Machines Corporation. Capacitive chip carrier and multilayer ceramic capacitors. 4,349,862, Cl. 361-401.000.
Baker CAC, Inc.: *See—*
Akkerman, Neil H.; and Foster, Stephen R., 4,349,175, Cl. 251-31.000.
Christensen, Bruce D., 4,349,043, Cl. 137-505.420.
Baker, Roscoe E.: *See—*
Furbish, William B.; and Baker, Roscoe E., 4,349,323, Cl. 425-147.000.
Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Metal web. 4,349,612, Cl. 428-607.000.
Baldwin, John J.: *See—*
Atkinson, Joseph G.; Baldwin, John J.; and McClure, David E., 4,349,673, Cl. 544-105.000.
Baldwin, Mark H., to Nestier Corporation. Shelf mounting bracket for storage rack. 4,349,171, Cl. 248-243.000.
Baldwin Piano & Organ Company: *See—*
Wade, David R., 4,348,931, Cl. 84-1.240.
Bales, Ray D.: *See—*
Chipman, Donald M.; and Bales, Ray D., 4,349,054, Cl. 141-1.000.
Balz, Gunther W., to Roto-Finish Company, Inc. Automatic finishing chip maker. 4,349,327, Cl. 425-436.00R.
Bandi, Jean-Pierre: *See—*
Raboud, Pierre-Benoit; Kubicek, Frantisek; and Bandi, Jean-Pierre, 4,349,579, Cl. 426-631.000.
Banks, Eddie D.: *See—*
Barnes, Franklin K.; and Banks, Eddie D., 4,349,168, Cl. 244-137.00R.
Banks, John J., Jr. Plant pot suspension apparatus and the like. 4,349,172, Cl. 248-318.000.
Banzai, Keiichiro: *See—*
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Barber, Norman R., to GEC Mechanical Handling Limited. Control means for motion compensation devices. 4,349,179, Cl. 254-270.000.
Barbero, Aquilino: *See—*
Bovio, Michele; Barbero, Aquilino; Gillone, Walter; and Berruti, Pierangelo, 4,349,829, Cl. 346-140.00R.
Barnard, Garland R.: *See—*
Boehme, Hollis; Barnard, Garland R.; Mellenbruch, Larry L.; and Dickens, Danny W., 4,349,897, Cl. 367-98.000.
Barnes, Franklin K.; and Banks, Eddie D., to Boeing Company, The. Cargo delivery system for aircraft. 4,349,168, Cl. 244-137.00R.
Barraque, Christian; and Darji, Jayantilal D., to Degremont. Method and apparatus for treating water by ion exchange. 4,349,442, Cl. 210-675.000.
Barry Wright Corporation: *See—*
Peterson, Robert R.; and Ventura, Daniel S., 4,349,184, Cl. 267-153.000.
Barsa, Edward A.; Lin, Chung-Yuan; and Stuber, Fred A., to Upjohn Company, The. Bis(cyclic ureas) monomer compositions useful in making polyurethane polymers. 4,349,663, Cl. 528-367.000.
Barth, Horst: *See—*
Holzbaur, Siegfried; Barth, Horst; and Osmera, Josef, 4,348,999, Cl. 123-452.000.
Barth, Tomislav: *See—*
Cort, Joseph H.; Barth, Tomislav; Jost, Karel; and Veznik, Zdenek, 4,349,544, Cl. 424-177.000.
BASF Aktiengesellschaft: *See—*
Klahr, Erhard; Trieselt, Wolfgang; Trapp, Horst; and Widder, Rudi, 4,349,669, Cl. 536-127.000.
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Harder, Wolfgang, 4,349,484, Cl. 260-453.00P.
BASF Wyandotte Corporation: *See—*
Narayan, Thirumurti, 4,349,638, Cl. 521-125.000.
Bates, H. John, to NL Industries, Inc. Control valve system for blowout preventers. 4,349,041, Cl. 137-1.000.
Battista, Orlando A. Protein polymer hydrogels. 4,349,470, Cl. 260-117.000.
Baumann, Marcus; Buhler, Niklaus; and Bellus, Daniel, to Ciba-Geigy Corporation. Cyclobutanedicarboxisoimides and use thereof as fungicides. 4,349,565, Cl. 424-279.000.
Baumann, Marcus: *See—*
Buhler, Niklaus; Baumann, Marcus; Bellus, Daniel; and Sturm, Elmar, 4,349,564, Cl. 424-274.000.
Bautista, Peter, Jr., to North American Philips Corporation. Acoustic impedance matching device. 4,348,904, Cl. 73-644.000.
Bay, Charles L. Thumb rest for woodwind musical instruments. 4,348,935, Cl. 84-380.00R.
Bay State Plastics Corp.: *See—*
DiNardo, Richard, 4,349,120, Cl. 220-337.000.
Bayer Aktiengesellschaft: *See—*
Blank, Heinz U.; Wolters, Erich; and Langenfeld, Norbert, 4,349,471, Cl. 260-208.000.
Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, 4,349,560, Cl. 424-273.00R.
Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, 4,349,416, Cl. 203-19.000.
Frank, Georg; and Wehling, Klaus, 4,349,351, Cl. 23-230.00B.
Goldmann, Siegfried, 4,349,675, Cl. 546-17.000.
Raue, Roderich; and Giesecke, Heinz, 4,349,670, Cl. 542-417.000.
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.
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Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, 4,349,718, Cl. 219-78.010.
BBC Brown, Boveri & Company, Ltd.: *See—*
Arnold, Niklaus; Schmidli, Josef; and Spiess, Peter, 4,349,759, Cl. 310-233.000.
Brandli, Gerold, 4,349,765, Cl. 313-220.000.
Stieger, Karl, 4,349,312, Cl. 415-145.000.
Beach, David L.; and Zambelli, Adolfo, to Gulf Research & Development Company. Process for the preparation of aluminum trihydrocarbyls. 4,349,483, Cl. 260-448.00A.
Beam, Benjamin H.; and Beam, Richard M., to Beam Engineering, Inc. Sun tracker. 4,349,733, Cl. 250-203.00R.
Beam Engineering, Inc.: *See—*
Beam, Benjamin H.; and Beam, Richard M., 4,349,733, Cl. 250-203.00R.
Beam, Richard M.: *See—*
Beam, Benjamin H.; and Beam, Richard M., 4,349,733, Cl. 250-203.00R.
Becker, Kunibert; and Beyer, Herbert, to Gewerkschaft Eisenhutte Westfalia. Longwall mineral mining installation. 4,349,229, Cl. 299-32.000.
Bee, Edward C., to National Semiconductor Corporation. Current product limit detector. 4,349,755, Cl. 307-492.000.
Beecham Group Limited: *See—*
Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., 4,349,551, Cl. 424-250.000.
Beerwald, Hans; Bohm, Gunter; and Glomski, Gunter. Gas-discharge method for coating the interior of electrically non-conductive pipes. 4,349,582, Cl. 427-38.000.
Beier, Ulrich: *See—*
Klar, Rudolf; and Beier, Ulrich, 4,349,122, Cl. 220-373.000.
Beiswenger, John L.; and Smiesko, Frank A., to Acme Burgess, Inc. Hose-end sprayer. 4,349,157, Cl. 239-509.000.
Beitecke, Bernd: *See—*
Geschka, Hugo W.; and Beitecke, Bernd, 4,348,877, Cl. 68-13.00R.
Belgard, Alan H.; Zoll, Paul M.; and Zoll, Ross H., to Zoll, Ross H. External noninvasive electric cardiac stimulation. 4,349,030, Cl. 128-419.0PG.
Bell, Malcolm R., to Sterling Drug Inc. Anti-inflammatory 8H-phenanthro-[2,3-c]pyrazole derivatives. 4,349,558, Cl. 424-273.00P.
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Bell Telephone Laboratories, Incorporated: *See—*
Aloisio, Charles J., Jr.; Blyler, Lee L., Jr.; Brockway, George S.; Hart, Arthur C., Jr.; and Taylor, Carl R., 4,349,587, Cl. 427-163.000.
Chin, Maurice A.; Narayanamurti, Venkatesh; and Stormer, Horst L., 4,349,796, Cl. 333-186.000.
Federico, Joseph; and Waaben, Sigurd G., 4,349,776, Cl. 323-222.000.
Gillis, Philip W., 4,349,704, Cl. 179-84.0VF.
Guelden, Ronald H., 4,349,236, Cl. 339-44.00M.
Hartman, Adrian R.; and Shackle, Peter W., 4,349,751, Cl. 307-252.00A.
Joel, Amos E., Jr., 4,349,702, Cl. 179-18.0GE.
Okinaka, Yutaka, 4,349,411, Cl. 156-659.100.
Pirz, Frank C.; and Rabiner, Lawrence R., 4,349,700, Cl. 179-1.0SD.
Scavuzzo, Robert J., 4,349,753, Cl. 307-272.00A.
Bellem, Norman A., to Butler Manufacturing Company. Insulated roof. 4,348,846, Cl. 52-410.000.
Bello, James R., to Lectromelt Corporation. Electrode positioning control. 4,349,912, Cl. 373-105.000.
Bellus, Daniel: *See—*
Baumann, Marcus; Buhler, Niklaus; and Bellus, Daniel, 4,349,565, Cl. 424-279.000.
Buhler, Niklaus; Baumann, Marcus; Bellus, Daniel; and Sturm, Elmar, 4,349,564, Cl. 424-274.000.

Beloit Corporation: *See*—
Parker, Daniel, 4,349,610, Cl. 428-447.000.
Belsky, Stephen E.; and Mathew, Chempolil T., to Allied Corporation. Production of methylnaphthalenes and tar bases including indole. 4,349,418, Cl. 203-45.000.
Beltz, John P.: *See*—
Southgate, Peter D.; and Beltz, John P., 4,349,880, Cl. 364-507.000.
Belz, Herman M., to Union Carbide Corporation. Method and apparatus for orientation of electrode joint threads. 4,349,910, Cl. 373-91.000.
Bennett, Harry. Acoustic ear mold. 4,349,083, Cl. 181-135.000.
Bentham, Thomas J. Frost removal system. 4,349,010, Cl. 126-271.100.
Bentley Laboratories: *See*—
Raible, Donald A., 4,349,021, Cl. 128-214.00R.
Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., to Beecham Group Limited. Penicillin derivatives and compositions containing them. 4,349,551, Cl. 424-250.000.
Bentley, Peter N. Liquid dispensing systems. 4,349,321, Cl. 417-250.000.
Berger, Bernard, to Pechiney Ugine Kuhlmann. Non-polluting treatment of alkaline uraniferous effluents containing $SO_4^{=}$ ions. 4,349,512, Cl. 423-7.000.
Berger, Leo; and Olson, Gary L., to Hoffmann-La Roche Inc. Octahydro-2-methyl-isoquinoline-6,8-dione. 4,349,678, Cl. 546-150.000.
Bergstrom, Arthur E.; Nelson, Richard H.; and Maly, George P., to Carbide Blast Joints, Inc. Blast joint for subterranean wells. 4,349,050, Cl. 138-147.000.
Bergthaller, Peter: *See*—
Sobel, Johannes; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,349,624, Cl. 430-622.000.
Berlivet, Marc A.; and Guerineau, Abel A. J., to Hesston Corporation. Rotary mower conditioner. 4,348,857, Cl. 56-192.000.
Berner, George J., to Hobart Corporation. Commodity key with on site encoding feature. 4,349,731, Cl. 235-489.000.
Berney, Jean, to Les Fabriques d'Assortiments Reunies. Elevation measuring instrument with selectable measurement scales. 4,348,813, Cl. 33-172.00R.
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, to Witco Chemical Corporation. Polyester resins for polyurethane foams prepared by reacting two diacids, diethylene glycol, a poly(oxyethylene) glycol and a cross-linking polyol. 4,349,662, Cl. 528-301.000.
Berruti, Pierangelo: *See*—
Bovio, Michele; Barbero, Aquilino; Gillone, Walter; and Berruti, Pierangelo, 4,349,829, Cl. 346-140.00R.
Betzing, Hans: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,349,684, Cl. 548-320.000.
Lautenschlager, Hans-Heiner; Betzing, Hans; Winkelmann, Johannes; Probst, Manfred; and Stoll, Brigitte, 4,349,686, Cl. 549-69.000.
Beyer, Herbert: *See*—
Becker, Kunibert; and Beyer, Herbert, 4,349,229, Cl. 299-32.000.
BFG Glassgroup: *See*—
Terneu, Robert, 4,349,370, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,369, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,371, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,372, Cl. 65-60.400.
Bhate, Suresh K., to Mechanical Technology Incorporated. Linear oscillating electric machine with permanent magnet excitation. 4,349,757, Cl. 310-15.000.
Bigg, Dennis, to Synthelabo. Thiazole derivatives and pharmaceutical compositions containing them. 4,349,557, Cl. 424-270.000.
Bigg, Dennis C., to Synthelabo. Thiazolidine-2,4-dione derivatives. 4,349,683, Cl. 548-183.000.
Biggs, James W.; and Maringer, Melvin F., to National Distillers & Chemical Corp. Flame retardant radiation curable polymeric compositions. 4,349,605, Cl. 428-389.000.
Bilet, Claude D.; Guillard, Michel G.; and Hedoin, Dominque A., to Compagnie de Signaux et d'Entreprises Electriques. Safety coding process for track circuits. 4,349,170, Cl. 246-63.000.
Binner, Tihamer S. Rear view mirror with slit clip attachment. 4,349,246, Cl. 350-298.000.
Bittar, Joseph; and Nowak, Frederick H., to Otis Elevator Company. Elevator motor/generator run protocol. 4,349,087, Cl. 187-29.00R.
Bixler, Stephen D.; Thomas, David T.; and Archer, Donald H., to Raytheon Company. Parabolic antenna with horn feed array. 4,349,827, Cl. 343-786.000.
Black Clawson Company, The: *See*—
Eklund, Henrik J., 4,349,413, Cl. 162-23.000.
Black & Decker Inc.: *See*—
Bachmann, Rainer; and Ulm, Helmut, 4,349,057, Cl: 144-230.000.
Blackburn, Marvin J., to Vernon Tool Company Ltd. Tape-controlled metal cutting apparatus. 4,349,182, Cl. 266-57.000.
Blackington, Paul A., to Sheltered Workshop for the Disabled, Inc. Fiber optic termination method and apparatus. 4,349,497, Cl. 264-1.500.
Blackmon, Lawrence E.; Dees, John R.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, to Fiber Industries, Inc. Continuous filament yarn with wool-like hand. 4,349,604, Cl. 428-370.000.
Blaesi, Max: *See*—
Obrist, Albert; Blaesi, Max; and Auer, Serge, 4,349,399, Cl. 156-86.000.
Blancke, Uwe: *See*—
Vural, Gulertan; and Blancke, Uwe, 4,348,901, Cl. 73-594.000.
Blank, Heinz U.; Wolters, Erich; and Langenfeld, Norbert, to Bayer Aktiengesellschaft. Process for the preparation of aromatic sulphonic acid halides. 4,349,471, Cl. 260-208.000.
Blaser, Paul; Schmidt, Helmut; and Strobel, Walter, to Kienzle Apparate GmbH. Keyboard assembled from individual keys. 4,349,286, Cl. 400-492.000.
Blechstein, Amihud, to Penn-Gil Fabrics, Inc. Double knit fabric processing into decorative goods. 4,349,593, Cl. 428-40.000.
Bleikolm, Anton: *See*—
Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, 4,349,655, Cl. 528-45.000.
Blenner, Donald R.; and Boenig, Herman V., to Lord Corporation. Method for bonding elastomers to steel. 4,349,403, Cl. 156-272.600.
Bliss & Laughlin Industries, Incorporated: *See*—
Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., 4,348,970, Cl. 112-256.000.
Block, Jacob, to W. R. Grace & Co. Viscosifier and fluid loss control system. 4,349,443, Cl. 252-8.50A.
Blocksome, Roderick K.; Hornbeck, Sherman J.; and Fee, Donald R., to Rockwell International Corporation. Switching between radio frequency circuits. 4,349,799, Cl. 333-246.000.
Bloem, Herman, to U.S. Philips Corporation. Method of connecting a plate-shaped absorber for solar heat to a tubular heat transport system. 4,348,793, Cl. 29-157.30A.
Blumenthal, Michael M.; and Stockler, Jerry R., to Oil Process Systems, Inc. Frying oil evaluator method and composition. 4,349,353, Cl. 23-230.00R.
Blyler, Lee L., Jr.: *See*—
Aloisio, Charles J., Jr.; Blyler, Lee L., Jr.; Brockway, George S.; Hart, Arthur C., Jr.; and Taylor, Carl R., 4,349,587, Cl. 427-163.000.
Bobart, Kevin L.; and Flurry, Gregory A., to International Business Machines Corporation. Ear code with alignment mark. 4,349,741, Cl. 250-568.000.
Bodendoerfer, Raymond E., to Paper Machinery Corporation. Blank wrapping mechanism for non-cylindrical container-making machines. 4,349,345, Cl. 493-295.000.
Boehme, Hollis; Barnard, Garland R.; Mellenbruch, Larry L.; and Dickens, Danny W., to United States of America, Navy. Bistatic Doppler underwater intrusion detection sonar. 4,349,897, Cl. 367-98.000.
Boeing Company, The: *See*—
Barnes, Franklin K.; and Banks, Eddie D., 4,349,168, Cl. 244-137.00R.
Desjardins, Rene A., 4,349,317, Cl. 416-134.00A.
Eves, William J.; and Lazaro, Luis J., Jr., 4,348,806, Cl. 29-863.000.
Reilly, Mason J., 4,349,167, Cl. 244-122.00R.
Boenig, Herman V.: *See*—
Blenner, Donald R.; and Boenig, Herman V., 4,349,403, Cl. 156-272.600.
Bogel, Gerhard, to SFS Stadler AG. Plastic ribbon for supply of bolt-like fastener elements. 4,349,106, Cl. 206-347.000.
Boh, Jules J.: *See*—
Ayotte, Gary A.; Boh, Jules J.; and Breen, Thomas G., 4,349,275, Cl. 356-36.000.
Bohm, Gunter: *See*—
Beerwald, Hans; Bohm, Gunter; and Glomski, Gunter, 4,349,582, Cl. 427-38.000.
Bohner, Beat: *See*—
Durr, Dieter; Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,349,377, Cl. 71-98.000.
Bokros, Jack C.: *See*—
Ellis, Willard H.; Haubold, Axel D.; Slivenko, Victor; and Bokros, Jack C., 4,349,498, Cl. 264-81.000.
Bolen, Charles E.; Harrington, Edward R.; Marzocchi, Alfred; and Roberts, Michael G., to Owens-Corning Fiberglas Corporation. Glass substrates with an insolubilized asphalt coating. 4,349,590, Cl. 427-389.700.
Bolen, Charles E.: *See*—
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,349,388, Cl. 106-281.00N.
Bommart, Patrick, to Delachaux, C. Rail gap adjusting device. 4,348,959, Cl. 104-15.000.
Bond, Helen I. Personal cleansing article for recto-genital region. 4,349,288, Cl. 401-7.000.
Bonfield, John H.; Sifniades, Stylianos; and Ulmer, Harry E., to Allied Corporation. Continuous hydrolysis of ketoxime. 4,349,520, Cl. 423-387.000.
Booth, George R. Inertial tire pressure regulators. 4,349,064, Cl. 152-418.000.
Borimsky, Alexandr I.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.
Bos, Arnold, to International Chemical Engineering Establishment. Process of and apparatus for curving a casing of stretched plastic material. 4,349,490, Cl. 264-25.000.
Bosch, Yves: *See*—
Ollivier, Jean; and Bosch, Yves, 4,349,141, Cl. 227-10.000.

Bosco, Lewis R.; and Bosco, Richard J. Weather shield for the firing mechanism of a gun and its method of manufacture. 4,348,829, Cl. 42-1.00N.

Bosco, Richard J.: *See*—
Bosco, Lewis R.; and Bosco, Richard J., 4,348,829, Cl. 42-1.00N.

Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic imidazolyl-indeno-thiophene compounds, composition and method of use. 4,349,560, Cl. 424-273.00R.

Boulanger, Henry J., to Texas Instruments Incorporated. Snap-acting thermostatic switch using inflexible, spring biased contact arm. 4,349,806, Cl. 337-343.000.

Bouyoucos, John V., to Hydroacoustics Inc. Hydraulic press apparatus. 4,348,943, Cl. 91-355.000.

Bovio, Michele; Barbero, Aquilino; Gillone, Walter; and Berruti, Pierangelo, to Ing. C. Olivetti & C., S.p.A. Non-impact printing method. 4,349,829, Cl. 346-140.00R.

Bower, Terry F.: *See*—
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,349,145, Cl. 228-208.000.

Bowers, William D.: *See*—
Scott, Ernest R.; and Bowers, William D., 4,349,361, Cl. 55-357.000.

Bowles, Arnold G., to Pressure Technology, Inc. Hot isostatic press with rapid cooling. 4,349,333, Cl. 432-205.000.

Bowyer, William H.: *See*—
Phillips, Robert B.; Bowyer, William H.; and Moxley, Bruce, 4,349,728, Cl. 235-400.000.

Boyadjieff, George I., to Varco International, Inc. Well pipe connecting and disconnecting apparatus. 4,348,920, Cl. 81-57.250.

Boyajian, Alfred Z. Carriage support for power-driven hand tool. 4,349,301, Cl. 408-112.000.

Brachman, Dina I.: *See*—
Eigen, Edward; and Brachman, Dina I., 4,349,534, Cl. 424-52.000.

Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Tobacco moistening and opening apparatus. 4,349,037, Cl. 131-306.000.

Bradley, Michael F.; and Viecelli, Jack C., to Longview Fibre Company. Gun carton. 4,349,105, Cl. 206-317.000.

Bradshaw, William, to Edgar Pickering (Blackburn) Ltd. Drying apparatus. 4,348,817, Cl. 34-75.000.

Brand, Wilhelm; and Baasner, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Vee belt measuring apparatus. 4,348,811, Cl. 33-125.00R.

Brandes, Wilhelm: *See*—
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.

Brandli, Gerold, to BBC Brown, Boveri & Company, Limited. Ultraviolet generating device comprising discharge tube joined to two tubular envelopes. 4,349,765, Cl. 313-220.000.

Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, to Bayer Aktiengesellschaft; and EC Erdolchemie GmbH. Process and device for the separation of mixtures which form an azeotrope. 4,349,416, Cl. 203-19.000.

Branson Ultrasonics Corporation: *See*—
Shoh, Andrew, 4,348,908, Cl. 73-862.540.

Braun, Ernst; Braun, Gert; and Wetzchewald, Karlheinz, to Halbach & Braun. Trench hewing tool assembly with cutter guard attachment. 4,349,232, Cl. 299-92.000.

Braun, Gert: *See*—
Braun, Ernst; Braun, Gert; and Wetzchewald, Karlheinz, 4,349,232, Cl. 299-92.000.

Brayer, Eyal, to S.C.R. Engineers Ltd. Control apparatus for milking machines. 4,348,984, Cl. 119-14.080.

Breen, Thomas G.: *See*—
Ayotte, Gary A.; Boh, Jules J.; and Breen, Thomas G., 4,349,275, Cl. 356-36.000.

Bremer, Clemens; and Klumpp, Walter, to Rheinmetall GmbH. Servorelease mechanism for an automatic weapon. 4,348,940, Cl. 89-140.000.

Brenner, John A.: *See*—
Brueggemann, Walter H.; and Brenner, John A., 4,349,601, Cl. 428-323.000.

Breuer, Hans-Werner: *See*—
Obrist, Albert; and Breuer, Hans-Werner, 4,349,174, Cl. 249-58.000.

Bridges, Charles D.: *See*—
McGee, John K.; and Bridges, Charles D., 4,349,205, Cl. 277-188.00A.

Bridgestone Tire Company Limited: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,349,061, Cl. 152-209.00R.
Kikuchi, Michitsugu; and Suzuki, Yoshio, 4,349,063, Cl. 152-359.000.
Tsurunaga, Yasuaki; Abe, Masaru; Hashimoto, Hideaki; and Tsuzura, Junichi, 4,349,062, Cl. 152-356.00R.
Ueno, Kazunori; and Kobayashi, Toru, 4,348,841, Cl. 52-126.500.

Brightwell, Alan: *See*—
Adams, Keith J. G.; Brightwell, Alan; Price, Barry L.; Pegler, Stuart M.; and Weall, Paul, 4,349,745, Cl. 307-12.000.

Brinker, Gerald W. Display device. 4,348,827, Cl. 40-607.000.

British Broadcasting Corporation: *See*—
Clarke, Christopher K. P., 4,349,833, Cl. 358-23.000.

British Gas Corporation: *See*—
Adams, Keith J. G.; Brightwell, Alan; Price, Barry L.; Pegler, Stuart M.; and Weall, Paul, 4,349,745, Cl. 307-12.000.

Brixner, Berlyn B.; Klein, Morris M.; and Winkler, Max A., to United States of America, Energy. Compound lens. 4,349,249, Cl. 350-483.000.

Brockmann, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Drive unit for land vehicles. 4,349,080, Cl. 180-301.000.

Brockway, George S.: *See*—
Aloisio, Charles J., Jr.; Blyler, Lee L., Jr.; Brockway, George S.; Hart, Arthur C., Jr.; and Taylor, Carl R., 4,349,587, Cl. 427-163.000.

Brokaw, Adrian P., to Analog Devices, Incorporated. Digital-to-analog converter with improved compensation arrangement for offset voltage variations. 4,349,811, Cl. 340-347.0DA.

Broman, John S. Process and device for wet milling of rocks and the like. 4,349,158, Cl. 241-21.000.

Bromberg, Howard M., to Flexi-Group Inc., The. Method of making slide calculator. 4,349,346, Cl. 493-325.000.

Brown, Alexander G. M.: *See*—
Jefferson, John R.; and Brown, Alexander G. M., 4,348,995, Cl. 123-366.000.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Hartmann, Bernd; and Meinhold, Henner, 4,349,773, Cl. 320-5.000.

Brown, Dale G., to American Cyanamid Company. Spiro-cyclopropyl amidinohydrazones, and use as insect and fire ant control agents. 4,349,553, Cl. 424-251.000.

Brown, David: *See*—
Rowe, Frederick; and Brown, David, 4,349,432, Cl. 208-130.000.

Brown, Robert C. Device for recovering the exhaust heat of a clothes dryer. 4,348,818, Cl. 34-77.000.

Brown, Robert H., to Talon, Inc. Slide fastener with improved clamps and method of manufacture. 4,348,789, Cl. 24-205.10R.

Brown, Troy L., to Hewlett-Packard Company. Sampled control loop with dynamic gain optimization. 4,349,868, Cl. 364-157.000.

Brown, William L., to SI Handling Systems, Inc. Substrate dispensing apparatus. 4,349,126, Cl. 221-112.000.

Brucato, George C. Auta-help. 4,348,978, Cl. 116-28.00R.

Brueggemann, Walter H.; and Brenner, John A., to Ferro Corporation. Protective skin on intricately molded product. 4,349,601, Cl. 428-323.000.

Brugere, Christiane; Goumondy, Jean-Pierre; Morel, Jean-Marie; and Zellner, Edmond, to Commissariat a l'Energie Atomique. Method for processing alkaline solutions containing radioactive iodine during reprocessing of nuclear fuels. 4,349,453, Cl. 252-627.000.

Bruhn, Andrew C. Carrying rack for motorcycles. 4,349,138, Cl. 224-30.00R.

Brunelle, Daniel J.; and Smith, William E., to General Electric Company. Monocarbonate transesterification process. 4,349,486, Cl. 260-463.000.

Bruns, Ludwig: *See*—
Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, 4,349,416, Cl. 203-19.000.

Brunswick Corporation: *See*—
Morgan, Edward J.; and Rohan, Neil A., 4,349,341, Cl. 440-51.000.
Staerzl, Richard E., 4,349,000, Cl. 123-491.000.

Bryant, Frank A.: *See*—
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Buchel, Karl H.: *See*—
Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, 4,349,560, Cl. 424-273.00R.
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.

Buckstead, John W.; Hoppe, Frederick J.; and Williams, Dennis W., to Paccar, Inc. Front end loader with bucket ejector assembly. 4,349,308, Cl. 414-725.000.

Buhler, Niklaus; Baumann, Marcus; Bellus, Daniel; and Sturm, Elmar, to Ciba-Geigy Corporation. Use of 1,2-dimethyl-3-fluoro-, 1-methyl-3,3-difluoro-, and 1,2-dimethyl-3,3-difluoro-cyclobutane-1,2-dicarbonic acid 3,5-dichlorophenyl imides as plant fungicides. 4,349,564, Cl. 424-274.000.

Buhler, Niklaus: *See*—
Baumann, Marcus; Buhler, Niklaus; and Bellus, Daniel, 4,349,565, Cl. 424-279.000.

Bull, Jeffrey F., to RCA Corporation. Actuation rate limiter. 4,349,754, Cl. 307-443.000.

Bullard, David E.; and Myers, Allen D., to Caterpillar Tractor Co. Method and apparatus for controlling wheel slip on differentially mounted wheels. 4,349,233, Cl. 303-96.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-6-keto-PGE-type compounds. 4,349,690, Cl. 560-121.000.

Bunker Ramo Corporation: *See*—
Juris, Mitchell A.; and Tomsa, Vladimir, 4,349,241, Cl. 339-143.00R.

Burch, Homer A.: *See*—
Schwan, Thomas J.; Burch, Homer A.; and Gray, Joseph E., 4,349,677, Cl. 546-142.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,349,906, Cl. 372-50.000.

Burroughs Corporation: *See*—
Rudd, Robert E., III, 4,349,830, Cl. 346-140.00R.
Volka, Lubomir J.; and Wentzel, Robert J., 4,349,173, Cl. 248-346.000.

Burton, Achmat T.: *See*—
Bain, Kenneth J. D.; King, Dennis E.; Worship, Lesley A.; and Burton, Achmat T., 4,349,117, Cl. 220-4.00F.

Busselet, Jean-Claude G., to Etablissements Valois. Aerosol container valve mounting. 4,349,135, Cl. 222-394.000.
Butler Manufacturing Company: *See—*
Bellem, Norman A., 4,348,846, Cl. 52-410.000.
Butterworth, Inc.: *See—*
Pacht, Amos, 4,349,154, Cl. 239-124.000.
Buxton, Keith, to Lucas Industries Limited. Stepper motor control circuit. 4,349,771, Cl. 318-685.000.
Byers, J. Otto, Jr.; and Locher, Donald A., to Commercial Shearing, Inc. Pressure and flow compensated control system with constant torque and viscosity sensing over-ride. 4,349,319, Cl. 417-222.000.
C-I-L Inc.: *See—*
Rowley, Edward K.; and Sprague, Allison A., 4,348,955, Cl. 102-317.000.
Cairns, Neil S.; and Hendershott, Loyd. Mobile home support system. 4,348,843, Cl. 52-167.000.
Camelot Industries Corporation: *See—*
Rupp, Wiktor J., 4,349,374, Cl. 65-107.000.
Campillo, Anthony J.; Hyer, Ronald C.; and Shapiro, Stanley J., to United States of America, Energy. Broadly tunable picosecond IR source. 4,349,907, Cl. 372-92.000.
Canon Kabushiki Kaisha: *See—*
Aoki, Kanemasa, 4,349,761, Cl. 310-266.000.
Kobayashi, Kazufumi; and Hashimoto, Shigeru, 4,349,265, Cl. 354-286.000.
Tezuka, Nobuo; and Hirohata, Michio, 4,349,264, Cl. 354-234.000.
Uchidoi, Masanori; and Urushihara, Kazunobu, 4,349,263, Cl. 354-234.000.
Watanabe, Yoshitaka, 4,349,262, Cl. 354-173.000.
Canon Seiki Kabushiki Kaisha: *See—*
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Carbide Blast Joints, Inc.: *See—*
Bergstrom, Arthur E.; Nelson, Richard H.; and Maly, George P., 4,349,050, Cl. 138-147.000.
Carbomedics, Inc.: *See—*
Ellis, Willard H.; Haubold, Axel D.; Slivenko, Victor; and Bokros, Jack C., 4,349,498, Cl. 264-81.000.
Cardellini, Claudio B. Loose leaf binder. 4,349,290, Cl. 402-55.000.
Cardellini, Vincenzo E. Loose leaf binder. 4,349,289, Cl. 402-30.000.
Cardot, Claude: *See—*
Lemoussu, Michel; and Cardot, Claude, 4,349,785, Cl. 329-50.000.
Carey, Norman H.; Emtage, John S.; Tacon, William C. A.; and Hallewell, Robert A., to G.D. Searle & Co. Plasmid vectors, production anduse thereof. 4,349,629, Cl. 435-172.000.
Carlsson, Eric; and Wide, Lars, to Aktiebolaget IRO. Thread delivery device with improved thread-storage drum, particularly for sticky yarns. 4,349,161, Cl. 242-47.010.
Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, to Bayerische Motoren Werke A.G. Installation for the resistance-welding of structural parts. 4,349,718, Cl. 219-78.010.
Carrier Corporation: *See—*
Androff, Joel W., 4,348,871, Cl. 62-239.000.
Foster, Glenn B.; and Post, John E., 4,348,868, Cl. 62-101.000.
Geary, Carl H., Jr., 4,349,291, Cl. 403-15.000.
Carroll, James C.; and Chapman, Donald L., to Square D Company. Raintight wireway. 4,349,220, Cl. 285-121.000.
Carty, John J., to Luftek, Inc. Self-cleaning chimney stack. 4,348,947, Cl. 98-58.000.
Casberg, John M.; and Putnam, Clair H., to Olin Corporation. Briquets of hydrated calcium hypochlorite. 4,349,493, Cl. 264-37.000.
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, to Philip Morris Incorporated. Apparatus for laser perforation of transported articles. 4,349,719, Cl. 219-121.0LK.
Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,348,932, Cl. 84-1.190.
Cassella Aktiengesellschaft: *See—*
Tappe, Horst; Kindler, Horst; Roth, Kurt; and Weyer, Hans-Jurgen, 4,349,348, Cl. 8-464.000.
Caterpillar Tractor Co.: *See—*
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Lindow, Edwin L.; and Richards, Bradley T., 4,349,717, Cl. 219-73.200.
Catoni, Mario: *See—*
Rossi, Pier P.; and Catoni, Mario, 4,349,473, Cl. 260-239.30A.
Caudel, Edward R., to Texas Instruments Incorporated. Semiconductor memory cell with synthesized load resistors. 4,349,894, Cl. 365-154.000.
Celanese Corporation: *See—*
Ochiai, Shinya, 4,349,435, Cl. 210-96.100.
Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See—*
Paulus, Philippe; and Economopoulos, Marios, 4,349,393, Cl. 148-142.000.
Ceskoslovenska akademie ved: *See—*
Cort, Joseph H.; Barth, Tomislav; Jost, Karel; and Veznik, Zdenek, 4,349,544, Cl. 424-177.000.
Chambers, Gary R. Osteotomy apparatus. 4,349,018, Cl. 128-92.00E.
Chambers, Michael. Device to assist growth of tomato plants and method of using the same. 4,348,831, Cl. 47-32.000.
Champion International Corporation: *See—*
Faller, Rudolph A., 4,349,124, Cl. 220-453.000.
Pritchard, Sheldon S., 4,349,107, Cl. 206-449.000.
Champion Spark Plug Company: *See—*
Johnson, Michael F., 4,349,153, Cl. 239-105.000.
Chance, Dudley A.: *See—*
Bajorek, Christopher H.; Chance, Dudley A.; and Ho, Chung W., 4,349,862, Cl. 361-401.000.
Chang, David C., to International Business Machines Corp. Time of day clock control. 4,349,890, Cl. 364-900.000.
Chang, Marguerite S.: *See—*
Mueller, Kurt F.; Chang, Marguerite S.; Farncomb, Robert F.; and Malotky, Lyle O., 4,349,396, Cl. 149-19.300.
Chang, Orson. Locks of suitcases with changeable combinations. 4,348,878, Cl. 70-5.000.
Chang, Wei K.: *See—*
Gold, Elijah H.; and Chang, Wei K., 4,349,472, Cl. 260-239.0BB.
Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, to Raychem Corporation. Polymeric articles. 4,349,404, Cl. 156-308.400.
Chapman, Donald L.: *See—*
Carroll, James C.; and Chapman, Donald L., 4,349,220, Cl. 285-121.000.
Charles, Joel M.; and Toscano, Robert J., to Etat Francais as represented by the Delegue General pour l'Armement. Device for handling from a boat a submerged load hooked onto the end of a cable. 4,349,180, Cl. 254-277.000.
Chaudhuri, Kiranendu B., to Klockner-Humboldt-Deutz AG. Method for the pyrometallurgical production of copper. 4,349,383, Cl. 75-73.000.
Chazov, Evgeny I.: *See—*
Maximenko, Alexandr V.; Torchilin, Vladimir P.; Smirnov, Vladimir N.; and Chazov, Evgeny I., 4,349,630, Cl. 435-180.000.
Chea, Ramon C. W., Jr., to International Telephone and Telegraph Corporation. Programmable ring signal generator. 4,349,703, Cl. 179-18.0HB.
Chechile, Robert A.: *See—*
Wirt, Thomas M.; and Chechile, Robert A., 4,349,183, Cl. 267-160.000.
Chemische Werke Huls AG: *See—*
Mumcu, Salih, 4,349,661, Cl. 528-288.000.
Chida, Yoshinori; and Tada, Satoru, to Seikosha Co., Ltd. Intermittent paper feed mechanism. 4,349,287, Cl. 400-569.000.
Chilzer, Edward L. Snow shuttle. 4,349,209, Cl. 280-16.000.
Chin, Maurice A.; Narayanamurti, Venkatesh; and Stormer, Horst L., to Bell Telephone Laboratories, Incorporated. Devices incorporating phonon filters. 4,349,796, Cl. 333-186.000.
Ching, Ta-Yen, to General Electric Company. Substrates coated with a thermoset acrylic primer and an alkoxysilylbenzotriazole UV stabilizer. 4,349,602, Cl. 428-331.000.
Ching, Ta-Yen, to General Electric Company. UV Stabilizers, coating compositions and composite structures obtained therefrom. 4,349,607, Cl. 428-412.000.
Chinn, Leland J., to G. D. Searle & Co. 2-Cyanosteroids. 4,349,474, Cl. 260-239.55C.
Chipman, Donald M.; and Bales, Ray D., to Plough, Inc. Method and apparatus for safely destroying aerosol containers. 4,349,054, Cl. 141-1.000.
Chisso Corporation: *See—*
Yamashita, Yoshisato; and Matsuo, Yutaka, 4,349,524, Cl. 423-488.000.
Yamashita, Yoshisato; and Matsuo, Yutaka, 4,349,525, Cl. 423-488.000.
Chloride Group Public Limited Company: *See—*
Terrel, Christopher, 4,349,865, Cl. 362-250.000.
Chobanian, Dennis A.; and McNaughton, R. Alan. Transducer for sensing string vibrational movement in two mutually perpendicular planes. 4,348,930, Cl. 84-1.150.
Christensen, Bruce D., to Baker CAC, Inc. Method and apparatus for prevention of over-pressurization of a pressure responsive device. 4,349,043, Cl. 137-505.420.
Christian Leather Company, Inc., The: *See—*
Woodson, Thomas W., 4,348,774, Cl. 2-338.000.
Christine, William C. Dispenser and refill package. 4,349,133, Cl. 222-183.000.
Christis, Wilhelmus J.: *See—*
Janssen, Peter J. H.; and Christis, Wilhelmus J., 4,349,904, Cl. 371-69.000.
Chromalloy American Corporation: *See—*
West, Frank L.; and Norton, Larry A., 4,349,856, Cl. 361-160.000.
Chu, Chin-Chiun; and Kaeding, Warren W., to Mobil Oil Corporation. Group VIIA metal-modified zeolite catalysts. 4,349,461, Cl. 252-455.00Z.
Chugai Seiyaku Kabushiki Kaisha: *See—*
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.
Churchill, John W., to Southport Enterprises, Inc. Heater unit. 4,349,727, Cl. 219-544.000.
Ciba-Geigy AG: *See—*
Seha, Zdenek, 4,349,478, Cl. 260-316.000.
Ciba-Geigy Corporation: *See—*
Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,349,567, Cl. 424-305.000.
Baumann, Marcus; Buhler, Niklaus; and Bellus, Daniel, 4,349,565, Cl. 424-279.000.
Buhler, Niklaus; Baumann, Marcus; Bellus, Daniel; and Sturm, Elmar, 4,349,564, Cl. 424-274.000.
Durr, Dieter; Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,349,377, Cl. 71-98.000.

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,349,550, Cl. 424-250.000.
Iqbal, Abul; and Lienhard, Paul, 4,349,671, Cl. 542-417.000.
Rosenberger, Siegfried, 4,349,445, Cl. 252-46.600.
Cichy, Paul, to Kennecott Corporation. Recovery of heavy metals from spent alumina. 4,349,381, Cl. 75-10.00R.
Cichy, Paul, to Kennecott Corporation. Process for casting fused refractory oxides having high melting points. 4,349,909, Cl. 373-84.000.
Cipolla, Thomas M.: *See*—
Mundy, Joseph L.; Porter, Gilbert B., III; and Cipolla, Thomas M., 4,349,277, Cl. 356-376.000.
Cities Service Company: *See*—
DiGuiseppi, Frank T., 4,349,734, Cl. 250-222.00R.
Claflin, Warren E.: *See*—
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.
Clancy, David, to Colgate-Palmolive Company. Method and apparatus for packaging loose material. 4,348,852, Cl. 53-469.000.
Clarion Co., Ltd.: *See*—
Ono, Sadao, 4,349,779, Cl. 323-318.000.
Tanaka, Yoshio; Nishikawa, Yasuhisa; and Hasumi, Ryoichi, 4,348,911, Cl. 74-10.330.
Clark, Jim W., to Superior Casing Crews, Inc. Pipe thread protector. 4,349,048, Cl. 138-96.00T.
Clark, Melford D. Magnetic drop game. 4,349,201, Cl. 273-400.000.
Clark, Robin D.: *See*—
Roszkowski, Adolph P.; Clark, Robin D.; and Kluge, Arthur F., 4,349,549, Cl. 424-248.550.
Clarke, Christopher K. P., to British Broadcasting Corporation. Apparatus for digital demodulation or modulation of television chrominance signals. 4,349,833, Cl. 358-23.000.
Claudius Peters AG: *See*—
Floter, Hans-Joachim, 4,349,331, Cl. 432-14.000.
Clements, Thomas W.: *See*—
Fallon, Merton R.; and Clements, Thomas W., 4,349,136, Cl. 222-396.000.
Cleveland Plastics of Tennessee, Inc.: *See*—
Fine, Jerome; and Harrington, Gene N., 4,349,597, Cl. 428-95.000.
Cliff, Geoffrey R.; Hunt, Russell G.; and Percival, Albert, to FBC Limited. Compounds useful as pesticides. 4,349,378, Cl. 11-103.000.
Cline, Harvey E., to General Electric Company. Process for X-ray microlithography using thin film eutectic masks. 4,349,621, Cl. 430-311.000.
Clouth Gummiwerke Aktiengesellschaft: *See*—
Hartmann, Ewald, 4,349,234, Cl. 305-56.000.
Cobaugh, Robert F.; and Graeff, Norwood C., to AMP Incorporated. Guide system for card edge connectors. 4,349,237, Cl. 339-65.000.
Cole, Jean R.; and Panaia, Raymond R., to Diagraph-Bradley Industries, Inc. Continuous stencil assembly and method of manufacturing it. 4,348,953, Cl. 101-128.210.
Colgate-Palmolive Company: *See*—
Clancy, David, 4,348,852, Cl. 53-469.000.
Eigen, Edward; and Brachman, Dina I., 4,349,534, Cl. 424-52.000.
Collagen Development Corp.: *See*—
Miyata, Teruo, 4,349,026, Cl. 128-294.000.
Collender, Robert B. Stereoscopic motion picture-circular to linear scan translator (alternate screen)-method and apparatus. 4,349,252, Cl. 352-58.000.
Collins, Darryl L.; Collins, Donna L.; Knapp, Merton C.; and Knapp, Evalyn L. Sheet gripping and handling device. 4,349,225, Cl. 294-16.000.
Collins, Donna L.: *See*—
Collins, Darryl L.; Collins, Donna L.; Knapp, Merton C.; and Knapp, Evalyn L., 4,349,225, Cl. 294-16.000.
Combustion Engineering, Inc.: *See*—
McGee, John K.; and Bridges, Charles D., 4,349,205, Cl. 277-188.00A.
von Beck, Harold F. V., 4,349,069, Cl. 165-4.000.
Commercial Shearing, Inc.: *See*—
Byers, J. Otto, Jr.; and Locher, Donald A., 4,349,319, Cl. 417-222.000.
Commissariat a l'Energie Atomique: *See*—
Brugere, Christiane; Goumondy, Jean-Pierre; Morel, Jean-Marie; and Zellner, Edmond, 4,349,453, Cl. 252-627.000.
Fitoussi, Richard; Lours, Sylvie; and Musikas, Claude, 4,349,350, Cl. 23-230.00R.
Compagnie de Signaux et d'Entreprises Electriques: *See*—
Bilet, Claude D.; Guillard, Michel G.; and Hedoin, Dominque A., 4,349,170, Cl. 246-63.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Lemoussu, Michel; and Cardot, Claude, 4,349,785, Cl. 329-50.000.
Perrigault, Claude; and Spiteri, Jean-Claude, 4,349,707, Cl. 179-175.31R.
Compagnie Internationale pour l'Informatique CII Honeywell Bull: *See*—
Gernelle, Francois, 4,349,285, Cl. 400-320.000.
Comparetto, John E. Cutting tool and a method of using same. 4,349,058, Cl. 145-24.000.
Concast AG: *See*—
Schmid, Markus; and Gloor, Hans, 4,349,066, Cl. 164-453.000.
Consolidation Coal Company: *See*—
Rohde, Edward C., 4,349,228, Cl. 299-10.000.
Container Corporation of America: *See*—
Jensen, James R., 4,349,147, Cl. 229-34.00R.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Klar, Rudolf; and Beier, Ulrich, 4,349,122, Cl. 220-373.000.
Conway, Antony J.: *See*—
Asher, Lynn E.; and Conway, Antony J., 4,349,181, Cl. 256-35.000.
Cooper, George N. Bumper hitch. 4,349,211, Cl. 280-481.000.
Cooper, Kenneth L. Method for inducing set in planktonic bivalves. 4,348,983, Cl. 119-4.000.
Copley, Russell D.; and Schlueter, Francis E., to Deere & Company. Tractor mounted cotton harvester. 4,348,856, Cl. 56-30.000.
Cort, Joseph H.; Barth, Tomislav; Jost, Karel; and Veznik, Zdenek, to Ceskoslovenska akademie ved. Method for increasing the milk let down in mammals. 4,349,544, Cl. 424-177.000.
Costas, John P., to General Electric Company. Minimization of multipath and doppler effects in radiant energy communication systems. 4,349,915, Cl. 375-40.000.
Coulter Electronics, Inc.: *See*—
Ayotte, Gary A.; Boh, Jules J.; and Breen, Thomas G., 4,349,275, Cl. 356-36.000.
Coury, Glenn E. Method for improved heat transfer. 4,349,068, Cl. 165-1.000.
Covaleski, Stanley F.: *See*—
Trainor, James T.; Covaleski, Stanley F.; and Adelmann, John C., 4,349,595, Cl. 428-64.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc. 4-Substituted-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,349,561, Cl. 424-274.000.
Creators, Inc.: *See*—
Miller, Jack V., 4,349,768, Cl. 315-105.000.
Critical Fluid Systems, Inc.: *See*—
DeFilippi, Richard P.; and Vivian, J. Edward, 4,349,415, Cl. 203-14.000.
Crooks, David R., to Hapad, Inc. Method and apparatus for beveling the front end of a felt pad. 4,348,837, Cl. 51-5.00R.
Crosby Valve & Gage Company: *See*—
Thompson, Leonard J., 4,349,885, Cl. 364-558.000.
Crossley, Roger, to John Wyeth & Brother Limited. Process for preparing 1-(3-bromo-2-alkylpropanoyl-L-proline derivatives. 4,349,480, Cl. 260-326.200.
Crossley, Roger; and Hill, David G., to John Wyeth & Brother Limited. Dithiocompounds. 4,349,555, Cl. 424-263.000.
Crothers, William G., to Deer Park Baking Co. Method and apparatus to make cookies. 4,349,574, Cl. 426-496.000.
Crowley, Albert T., to RCA Corporation. Precise digitally programmed frequency source. 4,349,887, Cl. 364-703.000.
Crudele, Lester M.: *See*—
Gunter, Thomas G.; Zolnowsky, John E.; and Crudele, Lester M., 4,349,873, Cl. 364-200.000.
Crystal Systems Inc.: *See*—
Schmid, Frederick, 4,349,178, Cl. 254-216.000.
Crystic Systems Limited: *See*—
Adams, Alfred A., 4,349,599, Cl. 428-233.000.
Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Di Vita, Pietro, 4,349,276, Cl. 356-73.100.
Cummins Engine Company, Inc.: *See*—
Stang, John H.; Ruthmansdorfer, David A.; and Reichenbach, Dean H., 4,348,991, Cl. 123-41.290.
Curren, Arthur N.: *See*—
Sovey, James S.; Forman, Ralph; Curren, Arthur N.; and Wintucky, Edwin G., 4,349,424, Cl. 204-192.00E.
Currier Piano Company, Inc.: *See*—
Kaman, Charles H.; and Mayerjak, Robert J., 4,348,933, Cl. 84-193.000.
Curti, Ezio. Loading and unloading device to be installed between two consecutive machines. 4,349,097, Cl. 198-369.000.
Cushing, David E.: *See*—
Woods, William E.; Stanley, Philip E.; Cushing, David E.; and Lemay, Richard A., 4,349,874, Cl. 364-200.000.
Cutler, Charles R.: *See*—
Prett, David M.; Ramaker, Brian L.; and Cutler, Charles R., 4,349,869, Cl. 364-159.000.
Cyclone International, Inc.: *See*—
Lawson, John D., 4,348,988, Cl. 119-53.000.
Cyr, Clifford R.; and Hagan, Nancy C., to Du Pont de Nemours, E. I., and Company. Solvent developable photoresist film. 4,349,620, Cl. 430-259.000.
Dahlberg, Anders, to Tatis Plasttantningar AB. Method to manufacture structural members of epoxy plastic. 4,349,401, Cl. 156-221.000.
Dai Nippon Printing Co., Ltd.: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; and Shimane, Koichi, 4,349,835, Cl. 358-76.000.
Daimler-Benz Aktiengesellschaft: *See*—
Grossner, Horst; Weiger, Gunter; and Schwegler, Gunter, 4,349,746, Cl. 307-106.000.
Kurth, Hermann W.; and Krugener, Rolf, 4,349,722, Cl. 219-202.000.
Dainippon Printing Co., Ltd.: *See*—
Hayashi, Masaho, 4,349,110, Cl. 206-606.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Ohtani, Masami, 4,349,267, Cl. 354-323.000.
Daintrey, Joseph W., to Gestetner Manufacturing Limited. Developer unit for dry toner electrophotographic copier. 4,348,979, Cl. 118-688.000.
D'Alessio, Antonio. Shoe structure. 4,348,820, Cl. 36-101.000.
D'Aloisio, Elio F.: *See*—
Stevenson, Christopher T. S.; and D'Aloisio, Elio F., 4,349,144, Cl. 228-2.000.

Dancy, Curtis. Retractable bulkheads for railroad flat cars. 4,348,963, Cl. 105-363.000.

Daniel, Jean P., to Thomson-CSF. Laser target designator system. 4,349,838, Cl. 358-125.000.

Daniel, Roger P., to Ford Motor Company. Force-indicating dummy legs. 4,349,339, Cl. 434-274.000.

Darji, Jayantilal D.: *See—*
Barraque, Christian; and Darji, Jayantilal D., 4,349,442, Cl. 210-675.000.

Daswick, Alexander C. Shoe sole structure. 4,348,821, Cl. 36-103.000.

Data Packaging Corporation: *See—*
Lyman, George F.; and Lowry, Alan, 4,349,632, Cl. 435-284.000.

Datotek, Inc.: *See—*
Morgan, Barrie O.; and Abmayr, David W., 4,349,695, Cl. 178-22.080.

Davidenko, Valery M.: *See—*
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

Davidovits, Joseph. Mineral polymers and methods of making them. 4,349,386, Cl. 106-85.000.

Davis, Burns; Gray, Theodore F.; and Musser, Harry R., to Eastman Kodak Company. Copolyesterethers. 4,349,469, Cl. 524-765.000.

Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., to Motorola, Inc. Lower temperature glass and hermetic seal means and method. 4,349,635, Cl. 501-15.000.

Davis, Earl K.; and Hey, Robert W., to Motorola, Inc. Glass hermetic seal. 4,349,692, Cl. 174-52.00H.

Davis, Paul; Weinstein, David; and Schneider, David, to Sweetheart Plastics, Inc. Bulk cone container. 4,349,571, Cl. 426-124.000.

Davis, William F., to Motorola, Inc. Band-gap voltage reference having an improved current mirror circuit. 4,349,778, Cl. 323-314.000.

Davy International Aktiengesellschaft: *See—*
Flesch, Wilhelm, 4,349,354, Cl. 48-77.000.

Dawson, Lindsay G.: *See—*
English, Martin; Pym, David P.; and Dawson, Lindsay G., 4,349,628, Cl. 435-161.000.

Day, Edward A., to Systems, Science and Software. Projectile having impact responsive initiator means. 4,348,958, Cl. 102-499.000.

Decalonne, Jacques, to Thomson-CSF. Inductive potentiometer. 4,349,822, Cl. 340-870.340.

Deer Park Baking Co.: *See—*
Crothers, William G., 4,349,574, Cl. 426-496.000.

Deere & Company: *See—*
Copley, Russell D.; and Schlueter, Francis E., 4,348,856, Cl. 56-30.000.
Gardner, Frank H.; and Kittle, Carl E., 4,348,917, Cl. 74-568.00R.

Dees, John R.: *See—*
Blackmon, Lawrence E.; Dees, John R.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,349,604, Cl. 428-370.000.

DeFilippi, Richard P.; and Vivian, J. Edward, to Critical Fluid Systems, Inc. Process for separating organic liquid solutes from their solvent mixtures. 4,349,415, Cl. 203-14.000.

Degremont: *See—*
Barraque, Christian; and Darji, Jayantilal D., 4,349,442, Cl. 210-675.000.

Degussa Aktiengesellschaft: *See—*
Goor, Gustaaf; and Kunkel, Wolfgang, 4,349,526, Cl. 423-588.000.

Delachaux, C.: *See—*
Bommart, Patrick, 4,348,959, Cl. 104-15.000.

della Valle, Francesco, to Fidia S.p.A. Treatment of arrhythmia with 8-chloro- or 8-bromocoumarin derivatives. 4,349,566, Cl. 424-281.000.

Demar, Viking V. Method and apparatus for burning solid fuel. 4,348,968, Cl. 110-344.000.

Demianczuk, Dionisyj; McLean, Gregory J.; and Franklin, Joseph E., to Republic Steel Corporation. Production of steel products with medium to high contents of carbon and manganese and superior surface quality. 4,348,800, Cl. 29-527.700.

Dempster Systems Inc.: *See—*
Wynn, Charles C.; and Hopkins, Donald J., 4,349,305, Cl. 414-408.000.

Dent, Anthony L.; Hertzenberg, Elliot P.; and Sherry, Howard S., to PQ Corporation. Toothpaste containing pH-adjusted zeolite. 4,349,533, Cl. 424-52.000.

Dentel, David A.; and Sanders, David C., to Great Lakes Chemical Corporation. Process for producing esters of 3,5-dibromo-4-hydroxybenzonitrile. 4,349,488, Cl. 260-465.00D.

Denzer, Walter L. Segregated slab structural products. 4,348,848, Cl. 52-432.000.

DePauw, Richard A.; and Staiert, Richard W., to International Harvester Company. Crop damage responsive control of rotor speed. 4,348,855, Cl. 56-10.200.

Desjardins, Rene A., to Boeing Company, The. Bearingless rotor for single and tandem helicopters. 4,349,317, Cl. 416-134.00A.

Deunhouwer, Anthony H.; and Kock, Hendrikus G., to U.S. Philips Corporation. Method of manufacturing cooling blocks for semiconductor lasers. 4,348,795, Cl. 29-411.000.

Developak Corporation: *See—*
Evers, Jack R., 4,349,344, Cl. 493-11.000.

DFH, Inc.: *See—*
Farque, C. Anthony, 4,349,774, Cl. 320-25.000.

D'Hinterland, Lucien D.; Serre, Hubert; and Normier, Gerard, to Pierre Fabre S.A. Process for preparing vaccines based on antigenic ribosomal fractions. 4,349,540, Cl. 424-92.000.

Diagraph-Bradley Industries, Inc.: *See—*
Cole, Jean R.; and Panaia, Raymond R., 4,348,953, Cl. 101-128.210.

DiChiara, Anthony J. Filling valve for beverage container filling machine. 4,349,055, Cl. 141-39.000.

Dickens, Danny W.: *See—*
Boehme, Hollis; Barnard, Garland R.; Mellenbruch, Larry L.; and Dickens, Danny W., 4,349,897, Cl. 367-98.000.

Diepers, Heinrich, to Siemens Aktiengesellschaft. Current transfer brush with graphite foils. 4,349,760, Cl. 310-248.000.

Dietz, Kurt: *See—*
Grassmann, Peter; Dietz, Kurt; and Meinel, Friedrich, 4,349,740, Cl. 378-25.000.

DiFrancesco, John G. Needle guide for implanting intra-ocular lens. 4,349,027, Cl. 128-303.00R.

Digital Equipment Corporation: *See—*
Lary, Richard F., 4,349,871, Cl. 364-200.000.

Digonsky, Viktor V.: *See—*
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

DiGuiseppi, Frank T., to Cities Service Company. Flow detector for solids. 4,349,734, Cl. 250-222.00R.

Dillingham, Robert G.: *See—*
Hamburger, Herman; and Dillingham, Robert G., 4,349,230, Cl. 299-33.000.

DiNardo, Richard, to Bay State Plastics Corp. Plastic box hinge. 4,349,120, Cl. 220-337.000.

Dinella, Donald; Haller, Albert H.; and Polakowski, Theodore D., Jr., to Western Electric Co., Inc. Method for distributing liquid over a surface. 4,349,589, Cl. 427-359.000.

Di Piazza, Learco, to European Atomic Energy Community (EURATOM). Mechanical control head for guiding the movement of a tool, particularly of an electrode adapted to make a cavity in a metal piece, by electroerosion. 4,349,716, Cl. 219-69.00E.

Ditto, Fred S., deceased; and by Ditto, Teresa M., executrix. Flow plug. 4,349,047, Cl. 138-93.000.

Ditto, Teresa M., executrix: *See—*
Ditto, Fred S., deceased; and Ditto, Teresa M., executrix, 4,349,047, Cl. 138-93.000.

Di Vita, Pietro, to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and system for determining refractive-index profiles of optical fibers. 4,349,276, Cl. 356-73.100.

Djordjevic, Ilija: *See—*
Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, 4,348,895, Cl. 73-119.00A.

Djurner, Jan K.: *See—*
Kubat, Josef; Rigdahl, Hans M.; and Djurner, Jan K., 4,349,504, Cl. 264-328.170.

Dr. Boger Duplomat Apparate KG (GmbH & Co.): *See—*
Holthusen, Bernd, 4,349,272, Cl. 355-69.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Jung, Eggert, 4,349,279, Cl. 356-402.000.

Dr. Johannes Heidenhain GmbH: *See—*
Kraus, Heinz, 4,349,808, Cl. 338-18.000.

Dohi, Fumio: *See—*
Miyake, Hajime; Matsumoto, Osamu; and Dohi, Fumio, 4,349,091, Cl. 192-53.00F.

Dolata, Hans; Meyle, Werner; and Weyda, Gunther, to Andreas Stihl. Saw chain for motor chain saws. 4,348,926, Cl. 83-833.000.

Dolhyj, Serge R.: *See—*
Velenyi, Louis J.; and Dolhyj, Serge R., 4,349,462, Cl. 252-455.00R.

Doljack, Frank A., to B. F. Goodrich Company, The. Signal detector circuit with gain control method. 4,349,883, Cl. 364-551.000.

Doll, Reinhard: *See—*
Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, 4,348,895, Cl. 73-119.00A.

Donguy, Paul, to Societe Europeene de Propulsion. Unfoldable divergent nozzle for a rocket engine. 4,349,155, Cl. 239-265.330.

Doss, James D. Shielded differentiator for automotive ignition applications. 4,349,782, Cl. 324-390.000.

Dove, Peter G. S. Supply boat spooling system. 4,348,975, Cl. 114-254.000.

Dovgal, Eduard Y.: *See—*
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

Dow Chemical Company, The: *See—*
Dunbar, Joseph E., 4,349,685, Cl. 549-33.000.
Malhotra, Sudarshan K., 4,349,680, Cl. 546-302.000.
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., 4,349,568, Cl. 424-330.000.
Orillion, Michael T., 4,349,457, Cl. 252-389.00R.
Renga, James M.; and Emmons, Albert H., 4,349,482, Cl. 549-518.000.
Renga, James M.; and Wang, Pen-Chung, 4,349,487, Cl. 260-465.00F.

Drabek, Jozef: *See—*
Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,349,567, Cl. 424-305.000.

Draber, Wilfried: *See—*
Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, 4,349,560, Cl. 424-273.00R.

Draft Systems, Inc.: *See—*
Fallon, Merton R.; and Clements, Thomas W., 4,349,136, Cl. 222-396.000.

Drake, Cyril F., to International Standard Electric Corporation. Glass composition. 4,349,025, Cl. 128-260.000.

Drake, Miles P.: *See—*
Sterling, Henley F.; and Drake, Miles P., 4,349,373, Cl. 65-60.800.

Dresser Industries, Inc.: *See—*
Fish, David W., 4,349,071, Cl. 166-124.000.

Drewes, William; and Vlicki, Edward M., to Drewes, William. Sonic weapon system. 4,349,898, Cl. 367-138.000.

Driver, Julian H.: *See—*
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,348,980, Cl. 118-717.000.

Drummond, James E.: *See—*
Fitch, Richard A.; Drummond, James E.; and Mondelli, Alfred A., 4,349,359, Cl. 55-151.000.

Ducker, William L., to Wind Engineering Corporation. Adjustable vane windmills. 4,349,315, Cl. 416-1.000.

Dudley, Betty J., deceased: *See—*
Williams, Joel L.; Dudley, Betty J., deceased; and Dudley, Kenneth H., executor, 4,349,467, Cl. 525-54.200.

Dudley, Kenneth H., executor: *See—*
Williams, Joel L.; Dudley, Betty J., deceased; and Dudley, Kenneth H., executor, 4,349,467, Cl. 525-54.200.

Dudzik, Winfried. Automatic labeling apparatus. 4,349,405, Cl. 156-358.000.

Duley, Walter W.: *See—*
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.

Dumenil, Claude G.; and Dumenil, Louis P. Automatic base seal. 4,348,836, Cl. 49-311.000.

Dumenil, Louis P.: *See—*
Dumenil, Claude G.; and Dumenil, Louis P., 4,348,836, Cl. 49-311.000.

Dumont, Antonio J.; and Theriault, Mario. Bale untying machine. 4,348,801, Cl. 29-564.300.

Dunbar, Joseph E., to Dow Chemical Company, The. 5-Substituted-benzoxathiol-2-ones. 4,349,685, Cl. 549-33.000.

Dunn, Charles S.; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Liquid cooled skimmer. 4,349,376, Cl. 65-345.000.

Dunn, Wendell E., Jr. Process for treating the gas stream from an aluminum value chlorination process. 4,349,516, Cl. 423-111.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cyr, Clifford R.; and Hagan, Nancy C., 4,349,620, Cl. 430-259.000.
Krespan, Carl G., 4,349,650, Cl. 526-243.000.
Maloney, Daniel E., 4,349,422, Cl. 204-98.000.

Duraplug Electricals Limited: *See—*
Akehurst, Douglas J., 4,349,814, Cl. 340-679.000.

Durr, Dieter; Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, to Ciba-Geigy Corporation. Phenoxyphenylthioalkanecarboxylic acid amides and their use as herbicides and plant growth regulants. 4,349,377, Cl. 71-98.000.

Dynascan Corporation: *See—*
Goldstein, Richard; and Schornack, Louis W., 4,349,748, Cl. 307-132.00E.

E.G.O. Electro-Gerate Blanc und Fischer: *See—*
Gossler, Gerhard, 4,349,726, Cl. 219-511.000.

E M I Limited: *See—*
Johnston, Samuel J. B., 4,349,499, Cl. 264-107.000.

E. R. Squibb & Sons, Inc.: *See—*
Morcos, Nabil A.; Haney, Thomas A.; and Wedeking, Paul W., 4,349,529, Cl. 424-1.000.

Earley, James A.: *See—*
Eldred, John W.; Legg, James B.; and Earley, James A., 4,349,101, Cl. 198-851.000.

Eastman Kodak Company: *See—*
Davis, Burns; Gray, Theodore F.; and Musser, Harry R., 4,349,469, Cl. 524-765.000.
Howe, Dennis G., 4,349,901, Cl. 369-45.000.
Meyer, James W.; and Mooney, John E., 4,349,259, Cl. 354-135.000.

Ebert, Michael: *See—*
Reick, Franklin G., 4,349,444, Cl. 252-16.000.

EC Erdolchemie GmbH: *See—*
Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, 4,349,416, Cl. 203-19.000.

Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,349,550, Cl. 424-250.000.

Economopoulos, Marios: *See—*
Paulus, Philippe; and Economopoulos, Marios, 4,349,393, Cl. 148-142.000.

Edanami, Kenichi: *See—*
Yamada, Masahide; Edanami, Kenichi; and Kuroda, Toshio, 4,349,546, Cl. 424-180.000.

Eden, Robert D. Intrauterine catheter. 4,349,033, Cl. 128-660.000.

Edgar Pickering (Blackburn) Ltd.: *See—*
Bradshaw, William, 4,348,817, Cl. 34-75.000.

Edstrom, Lars G., to Malmohus Invest AB. Module for picking, transportation and depositing of sheeted or folded material. 4,349,189, Cl. 271-251.000.

Efimov, Vyacheslav T.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; Shamsha, Ljudmila F.; and Axenko, Alexandr A. Apparatus for electrochemical purification of contaminated liquids. 4,349,430, Cl. 204-302.000.

Efuti Giken Co.: *See—*
Kawai, Tsutomu, 4,349,852, Cl. 360-137.000.

Egger, Robert S. Home roof gutter sweep. 4,349,039, Cl. 134-167.00C.

Egorov, Vitaly Y.: *See—*
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

Eickmann, Karl. Radial piston machine with free—floating piston and piston—shoe assemblies. 4,348,946, Cl. 91-489.000.

Eigen, Edward; and Brachman, Dina I., to Colgate-Palmolive Company. Dentifrice composition. 4,349,534, Cl. 424-52.000.

Eisenberg, Bernard C., to Solbern Corp. Method and apparatus for filling containers with liquid. 4,349,053, Cl. 141-1.000.

Eklund, Henrik J., to Black Clawson Company, The. Cellulosic fiber insulation and process of preparation. 4,349,413, Cl. 162-23.000.

Eldred Company, The: *See—*
Eldred, John W.; Legg, James B.; and Earley, James A., 4,349,101, Cl. 198-851.000.

Eldred, John W.; Legg, James B.; and Earley, James A., to Eldred Company, The. Conveyor of endless chain type with eccentric arrangement to overcome chordal action. 4,349,101, Cl. 198-851.000.

Elevator GmbH: *See—*
Torenius, Pekka; and Suur-Askola, Seppo, 4,349,858, Cl. 361-181.000.

Elkem A/S: *See—*
Espedalen, Kare, 4,349,060, Cl. 152-172.000.

Ellersick, Russell. Articulate radiant heater module. 4,349,724, Cl. 219-347.000.

Ellis, Brian A. J. Motion transfer apparatus for use in self steering apparatus for boats. 4,348,973, Cl. 114-144.00C.

Ellis, Edric: *See—*
Owen, Harry; and Ellis, Edric, 4,349,634, Cl. 501-13.000.

Ellis, Willard H.; Haubold, Axel D.; Slivenko, Victor; and Bokros, Jack C., to Carbomedics, Inc. Radio-opaque markers for pyrolytic carbon prosthetic members. 4,349,498, Cl. 264-81.000.

Elter, Claus: *See—*
Schoening, Josef; Elter, Claus; and Schmitt, Hermann, 4,349,507, Cl. 376-230.000.

Eltra Corporation: *See—*
Strader, Charles J.; and Walle, Richard V., 4,348,840, Cl. 52-180.000.

Emanuel, Ervin M. Apparatus and method for testing the performance of electrical machines. 4,348,892, Cl. 73-116.000.

Emerson, Reginald S.; and Lovelock, John E., to Leslie Hartridge Limited. Fuel quantity measuring apparatus. 4,348,894, Cl. 73-119.00A.

Emmons, Albert H.: *See—*
Renga, James M.; and Emmons, Albert H., 4,349,482, Cl. 549-518.000.

Emtage, John S.: *See—*
Carey, Norman H.; Emtage, John S.; Tacon, William C. A.; and Hallewell, Robert A., 4,349,629, Cl. 435-172.000.

Endo, Kiichi: *See—*
Noguchi, Tatsuhiko; Kurita, Ryuichi; Nemoto, Ken; and Endo, Kiichi, 4,349,447, Cl. 252-117.000.

English, Martin; Pym, David P.; and Dawson, Lindsay G., to Kins Developments Limited. Fermentation process for the manufacture of an organic compound. 4,349,628, Cl. 435-161.000.

Enoki, Takahiro: *See—*
Kuramoto, Kikuzo; and Enoki, Takahiro, 4,348,790, Cl. 24-211.00P.

Environmental Electronics Corporation: *See—*
Owen, Charles B., 4,349,511, Cl. 422-186.070.

Eny, Nicholas R., to Koval, Stephen F. Roof bolt tension head and method of use. 4,349,299, Cl. 405-261.000.

Equipements Automobiles Marchal: *See—*
Fournier, Gerard R., 4,348,782, Cl. 15-250.320.

Erwin, John R., to Garrett Corporation, The. Compressor diffuser and method. 4,349,314, Cl. 415-181.000.

Escaron, Pierre C.; and Hoppe, Joachim A., to Schlumberger Technology Corporation. Method and apparatus for conducting logging or perforating operations in a borehole. 4,349,072, Cl. 166-250.000.

Esmond, William G. Capillary tube exchange device. 4,349,440, Cl. 210-321.100.

Espedalen, Kare, to Elkem A/S. Means for improving the surface grip of a tire of a vehicle and a method for manufacturing such means. 4,349,060, Cl. 152-172.000.

Essex Group, Inc.: *See—*
Stein, John C.; and Hutchison, Donald W., 4,348,870, Cl. 62-140.000.

Establissements Valois: *See—*
Busselet, Jean-Claude G., 4,349,135, Cl. 222-394.000.

Etat Francais as represented by the Delegue General pour l'Armement: *See—*
Charles, Joel M.; and Toscano, Robert J., 4,349,180, Cl. 254-277.000.

Ethyl Products Company: *See*—
Luenser, Werner R., 4,349,116, Cl. 215-330.000.
Etoh, Yukihiro: *See*—
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,348,994, Cl. 123-198.00F.
Etschenberg, Eugen: *See*—
Jacobi, Haireddin; Opitz, Wolfgang; and Etschenberg, Eugen, 4,349,543, Cl. 424-177.000.
Etzold, Karl-Friedrich: *See*—
Valachovic, John; Alphonse, Gerard A.; Reisner, John H.; and Etzold, Karl-Friedrich, 4,349,902, Cl. 369-132.000.
European Atomic Energy Community (EURATOM): *See*—
Di Piazza, Learco, 4,349,716, Cl. 219-69.00E.
Europtool Trust: *See*—
Arabian, Sandro, 4,349,131, Cl. 222-135.000.
Evans, Randall G., to Ford Aerospace & Communications Corp. Bit synchronous switching system for space diversity operation. 4,349,914, Cl. 375-40.000.
Everett, Nicholas W., to Sussman, Richard; and Everett, Wynne. Garment pressing machines. 4,349,137, Cl. 223-73.000.
Everett, Wynne: *See*—
Everett, Nicholas W., 4,349,137, Cl. 223-73.000.
Evers, Jack R., to Developak Corporation. Tube and pouch forming mandrel assembly. 4,349,344, Cl. 493-11.000.
Everts & Van der Weyden Exploitatiemaatschappij: *See*—
Lubbers, Marius H., 4,349,150, Cl. 238-265.000.
Eves, William J.; and Lazaro, Luis J., Jr., to Boeing Company, The. Selective contact crimper. 4,348,806, Cl. 29-863.000.
Ewig, John F., to Parker Manufacturing Co. Electric stapler and driver assembly therefor. 4,349,143, Cl. 227-131.000.
Exide Corporation: *See*—
Werth, John, 4,349,614, Cl. 429-50.000.
Exxon Research & Engineering Co.: *See*—
Kwon, Yiduk; and Lawson, Paul, 4,349,775, Cl. 320-35.000.
Eyden, Everett A. Method for forming a concrete deck. 4,349,491, Cl. 264-35.000.
Facit Aktiebolag: *See*—
Andersson, Leif H., 4,349,284, Cl. 400-320.000.
FAD Company, Inc.: *See*—
Scott, David F., 4,349,202, Cl. 273-422.000.
Faith, Thomas J., Jr., to RCA Corporation. Monitor for oxygen concentration in aluminum-based films. 4,348,886, Cl. 73-19.000.
Faller, Rudolph A., to Champion International Corporation. Composite paperboard tray. 4,349,124, Cl. 220-453.000.
Fallon, Merton R.; and Clements, Thomas W., to Draft Systems, Inc. Safety pressure reducing regulator. 4,349,136, Cl. 222-396.000.
Fan, Albert K.: *See*—
Long, Robert A.; and Fan, Albert K., 4,349,518, Cl. 423-308.000.
Fanning, William J., to Western Electric Company, Inc. Device for receiving and packaging a strip of electrical components. 4,349,162, Cl. 242-54.00R.
Farncomb, Robert F.: *See*—
Mueller, Kurt F.; Chang, Marguerite S.; Farncomb, Robert F.; and Malotky, Lyle O., 4,349,396, Cl. 149-19.300.
Farooq, Saleem: *See*—
Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,349,567, Cl. 424-305.000.
Farque, C. Anthony, to DFH, Inc. Polarity matching apparatus for jumper cables. 4,349,774, Cl. 320-25.000.
FBC Limited: *See*—
Cliff, Geoffrey R.; Hunt, Russell G.; and Percival, Albert, 4,349,378, Cl. 11-103.000.
Federico, Joseph; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. DC-to-DC Converters utilizing FET devices. 4,349,776, Cl. 323-222.000.
Fee, Donald R.: *See*—
Blocksome, Roderick K.; Hornbeck, Sherman J.; and Fee, Donald R., 4,349,799, Cl. 333-246.000.
Feldgun, Leon I.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.
Feller, Murray F., to Wilgood Corporation. Acoustic flow sensors. 4,348,906, Cl. 73-861.770.
Felten, Gilbert A.: *See*—
Stalter, Joseph F.; and Felten, Gilbert A., 4,349,406, Cl. 156-416.000.
Fenamec (Australia) Pty. Ltd.: *See*—
Vickers, Derek; and Waterhouse, John C., 4,349,114, Cl. 211-151.000.
Ferguson, Jesse T., Jr., to Lockheed Corporation. Pallet latching mechanism. 4,349,302, Cl. 410-69.000.
Ferro Corporation: *See*—
Brueggemann, Walter H.; and Brenner, John A., 4,349,601, Cl. 428-323.000.
Fiber Industries, Inc.: *See*—
Blackmon, Lawrence E.; Dees, John R.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,349,604, Cl. 428-370.000.
Fichtel & Sachs AG: *See*—
Schwerdhofer, Hans-Joachim, 4,349,342, Cl. 474-80.000.
Fidia S.p.A.: *See*—
della Valle, Francesco, 4,349,566, Cl. 424-281.000.
Fielden, John S.: *See*—
Peddie, Robert A.; and Fielden, John S., 4,349,879, Cl. 364-492.000.
Figura, Ilona W.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,349,646, Cl. 525-256.000.
Fijitsu Limited: *See*—
Shirato, Takehide, 4,348,802, Cl. 29-571.000.
Fine, Jerome; and Harrington, Gene N., to Cleveland Plastics of Tennessee, Inc. Production of synthetic leather. 4,349,597, Cl. 428-95.000.
Finike Italiana Marposs, S.p.A.: *See*—
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,348,814, Cl. 33-178.00E.
Fink, Anton, to Metrology Systems Corp. Fluid actuated chuck. 4,349,207, Cl. 279-4.000.
Finney, Cecil H., to Armstrong Cork Company. Automatic transmission shift locking device. 4,349,089, Cl. 192-4.00A.
Firestone Tire & Rubber Company, The: *See*—
Pilarski, Regis V., 4,349,216, Cl. 280-807.000.
Fischbeck, Kenneth H.; Schnarr, Marcus M.; and Paraskevopoulos, Demetris F., to Xerox Corporation. Method and apparatus for oscillating an array of marking elements. 4,349,828, Cl. 346-1.100.
Fish, David W., to Dresser Industries, Inc. Cement retainer and setting tool assembly. 4,349,071, Cl. 166-124.000.
Fitch, Richard A.; Drummond, James E.; and Mondelli, Alfred A., to Maxwell Laboratories, Inc. Electrostatic precipitator apparatus having an improved ion generating means. 4,349,359, Cl. 55-151.000.
Fitoussi, Richard; Lours, Sylvie; and Musikas, Claude, to Commissariat a l'Energie Atomique. Process for the determination of uranium (VI) or dialkyl dithiophosphoric acid present in an organic solvent. 4,349,350, Cl. 23-230.00R.
Flanigen, Edith M., to Union Carbide Corporation. Acetylene storage vessel. 4,349,463, Cl. 252-457.000.
Flatley, Doris W.; and Hsu, Sheng T., to RCA Corporation. Process for tapering openings in ternary glass coatings. 4,349,584, Cl. 427-85.000.
Fleischer, Donald W.: *See*—
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,349,882, Cl. 364-509.000.
Flesch, Wilhelm, to Davy International Aktiengesellschaft. Furnace for gasifying granular fuels. 4,349,354, Cl. 48-77.000.
Flexi-Group Inc., The: *See*—
Bromberg, Howard M., 4,349,346, Cl. 493-325.000.
Flir Systems, Inc.: *See*—
Laakmann, Katherine D.; and Laakmann, Peter, 4,349,843, Cl. 358-206.000.
Floter, Hans-Joachim, to Claudius Peters AG. Furnace installation including fuel milling and burnt product cooling and method of operating same. 4,349,331, Cl. 432-14.000.
Flurry, Gregory A.; Krieg, Michael L.; and Phillips, David W., to International Business Machines Corporation. Bar code with alignment mark. 4,349,742, Cl. 250-568.000.
Flurry, Gregory A.: *See*—
Bobart, Kevin L.; and Flurry, Gregory A., 4,349,741, Cl. 250-568.000.
Fohl, Artur, to REPA Feinstanzwerk GmbH. Deflection fitting for a safety belt. 4,349,217, Cl. 280-808.000.
Fonio, Carlo, to Rockwell-Rimoldi, S.p.A. Apparatus for loading web supply rolls into folding machines. 4,349,306, Cl. 414-684.000.
Fontana, Frank J., to Stewart-Warner Corporation. Swivel type caster with seal and lubrication ring. 4,348,784, Cl. 16-36.000.
Forbriger, Arthur W., Jr., to Tressa, Inc. Permanent wave neutralizer. 4,349,537, Cl. 424-71.000.
Ford Aerospace & Communications Corp.: *See*—
Evans, Randall G., 4,349,914, Cl. 375-40.000.
Ford Motor Company: *See*—
Daniel, Roger P., 4,349,339, Cl. 434-274.000.
Forman, Ralph: *See*—
Sovey, James S.; Forman, Ralph; Curren, Arthur N.; and Wintucky, Edwin G., 4,349,424, Cl. 204-192.00E.
Forte, Luciano, to Reliance Electric Company. Magnetic couple drive circuit for power switching device. 4,349,752, Cl. 307-254.000.
Foster, Glenn B.; and Post, John E., to Carrier Corporation. Automatic dilution control for absorption refrigeration. 4,348,868, Cl. 62-101.000.
Foster, Robert D.; and Weeden, Frank G. Apparatus for manufacturing articles by pressing and sintering. 4,349,326, Cl. 425-405.00R.
Foster, Stephen R.: *See*—
Akkerman, Neil H.; and Foster, Stephen R., 4,349,175, Cl. 251-31.000.
Fournier, Gerard R., to Equipements Automobiles Marchal. Windscreen wiper comprising an arm with an attached end fitting, in particular for motor vehicles. 4,348,782, Cl. 15-250.320.
Frank, Georg; and Wehling, Klaus, to Bayer Aktiengesellschaft. Reagent for the determination of haemoglobin. 4,349,351, Cl. 23-230.00B.
Franklin Institute, The: *See*—
Pytlewski, Louis L.; and Krevitz, Kenneth, 4,349,380, Cl. 75-0.50A.
Franklin, Joseph E.: *See*—
Demianczuk, Dionisyj; McLean, Gregory J.; and Franklin, Joseph E., 4,348,800, Cl. 29-527.700.
Franks, Larrabee: *See*—
Harvey, Francis K.; Franks, Larrabee; and Ingraham, David L., 4,349,036, Cl. 131-240.00R.
Freed, Elisabeth H., deceased (by Freed, Meier E., executor); Wei, Peter H. L.; and McCaully, Ronald J., to American Home Products Corporation. Quinoalinyl esters of carbamimidothioic acids. 4,349,674, Cl. 544-353.000.
Freed, Meier E., executor: *See*—
Freed, Elisabeth H., deceased; Wei, Peter H. L.; and McCaully, Ronald J., 4,349,674, Cl. 544-353.000.

French, Kenneth; and Piorkow, Alfred, to GTE Products Corporation. Comparator mask for aperture measuring apparatus. 4,349,278, Cl. 356-394.000.

Friedli, Hans: *See—*
Gut, Edwin; Arnold, Erwin; Maugweiler, Gottfried; and Friedli, Hans, 4,349,231, Cl. 299-69.000.

Friedman, Bernard. Fryer oil treatment composition and method. 4,349,451, Cl. 252-190.000.

Friedman, Melvin; and Holmes, William A., to Polaroid Corporation. Camera having a selected pattern of pre-exposure for final exposure correction. 4,349,257, Cl. 354-126.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Humpert, Jurgen, 4,349,149, Cl. 236-12.00R.

Friedrich, Jan B.: *See—*
Wainwright, Mark S.; Marsden, Warwich L.; and Friedrich, Jan B., 4,349,464, Cl. 252-463.000.

Frohberger, Paul-Ernst: *See—*
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.

Fryer, Rodney I.: *See—*
Walser, Armin; and Fryer, Rodney I., 4,349,475, Cl. 260-244.400.
Walser, Armin; and Fryer, Rodney I., 4,349,476, Cl. 260-244.400.
Walser, Armin; and Fryer, Rodney I., 4,349,477, Cl. 260-244.400.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Morozumi, Takuro, 4,348,996, Cl. 123-440.000.

Fuji Kiko Co., Ltd.: *See—*
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,349,215, Cl. 280-804.000.

Fuji Photo Film Co., Ltd.: *See—*
Ikenoue, Shinpei; Mifune, Hiroyuki; and Fuseya, Yoshiharu, 4,349,623, Cl. 430-600.000.
Kawashiri, Kazuhiro; Mizobuchi, Yuzo; Higashi, Akio; Tamura, Hiroshi; Takeda, Keiji; and Nagata, Masayoshi, 4,349,617, Cl. 430-59.000.
Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, 4,349,618, Cl. 430-83.000.
Okishi, Yoshio, 4,348,954, Cl. 101-465.000.
Sawano, Yukio, 4,349,836, Cl. 358-93.000.
Yamamura, Nobuo; and Takeda, Motoaki, 4,349,455, Cl. 252-312.000.

Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; and Hayashi, Mitsuo, to Toyo Jozo Kabushiki Kaisha. Aminoglycoside antibiotic G-367-2. 4,349,667, Cl. 536-13.900.

Fujikawa, Tetsuzo; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Exhaust system for a two-cycle engine. 4,348,862, Cl. 60-314.000.

Fujimoto, Tadaaki: *See—*
Takahata, Kazunori; Taniguchi, Katsuo; and Fujimoto, Tadaaki, 4,349,419, Cl. 203-70.000.

Fujimura, Akira: *See—*
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,005, Cl. 123-571.000.
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,006, Cl. 123-571.000.

Fujisawa Pharmaceutical Company, Ltd.: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Takaya, Takao; and Tozuka, Zenzaburo, 4,349,552, Cl. 424-251.000.

Fujita, Yukio: *See—*
Iwanami, Teruo; Takida, Hiroshi; and Fujita, Yukio, 4,349,644, Cl. 525-57.000.

Fujitsu Limited: *See—*
Isogai, Hideaki, 4,349,895, Cl. 365-230.000.
Sasaki, Nobuo, 4,348,803, Cl. 29-574.000.
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, 4,349,409, Cl. 156-643.000.
Takeda, Shiro; and Nakajima, Minoru, 4,349,609, Cl. 428-429.000.
Terakawa, Toshiaki, 4,349,819, Cl. 340-812.000.
Toyokura, Nobuo; Tokunaga, Hiroshi; Inoue, Shinichi; Ishikawa, Hajime; and Shinoda, Masaichi, 4,349,395, Cl. 148-187.000.

Fukasawa, Sigeru; and Mizokawa, Sadao, to Hitachi, Ltd. Interrupt control system. 4,349,872, Cl. 364-200.000.

Fukui, Kiyozumi, to Teijin Seiki Company Limited. Speed change device. 4,348,918, Cl. 74-805.000.

Fukukita, Hiroshi: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, 4,348,902, Cl. 73-626.000.

Fukumoto, Akira: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, 4,348,902, Cl. 73-626.000.

Fukushima, Hiroshi: *See—*
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Misumi, Akira; and Fukushima, Hiroshi, 4,349,766, Cl. 313-346.00R.

Fulchiron, Noel; and Naillon, Bernard, to "Thomson-Brandt". Safety release device for a load suspended from an aircraft for transport and charge equipped with such a device. 4,348,936, Cl. 89-1.50D.

Fulmer, Glenn E., to W. R. Grace & Co. Method of making a fire-retardant product having a foamed lore and a fire-retardant protective layer. 4,349,494, Cl. 264-45.300.

Funai Electric Co., Ltd.: *See—*
Kawai, Tsutomu, 4,349,852, Cl. 360-137.000.

Furbish, William B.; and Baker, Roscoe E., to Ray-O-Vac Corporation. Apparatus for continuously feeding powders. 4,349,323, Cl. 425-147.000.

Furihata, Makoto: *See—*
Tonomura, Kenichi; Takahashi, Kyoichi; and Furihata, Makoto, 4,349,834, Cl. 358-27.000.

Furuya, Takafumi: *See—*
Yaji, Saichi; Kitawaki, Kazuya; and Furuya, Takafumi, 4,349,052, Cl. 139-92.000.

Fuseya, Yoshiharu: *See—*
Ikenoue, Shinpei; Mifune, Hiroyuki; and Fuseya, Yoshiharu, 4,349,623, Cl. 430-600.000.

G.D. Searle & Co.: *See—*
Carey, Norman H.; Emtage, John S.; Tacon, William C. A.; and Hallewell, Robert A., 4,349,629, Cl. 435-172.000.
Chinn, Leland J., 4,349,474, Cl. 260-239.55C.

Gaget, Alain; and Juillot, Guy, to Gaget, Alain. Jet for the production of a vaporized idling mixture in an internal combustion engine. 4,349,489, Cl. 261-41.00D.

Gaia, Aldino J., to McGraw-Edison Company. Current limiting fuse having transverse parallel weak spots. 4,349,802, Cl. 337-159.000.

Gaia, Aldino J., to McGraw-Edison. Fuse assembly for a miniature plug-in fuse. 4,349,804, Cl. 337-198.000.

Gailey, Lynn: *See—*
Wollam, Carl A.; and Gailey, Lynn, 4,348,849, Cl. 52-545.000.

Gallitzendorfer, Rainer J. Wave form generator for sound formation in an electronic musical instrument. 4,348,929, Cl. 84-1.010.

Gallo, Luigi C., to Ampex Corporation. Digital data rate corrector and time base corrector. 4,349,832, Cl. 358-8.000.

Gamble, James E. Heated can rolls of high thermal efficiency. 4,348,819, Cl. 34-110.000.

Ganster, Charles A.; and Nelson, Gerald V., to Texaco Inc. Feedstock temperature control system. 4,349,884, Cl. 364-557.000.

Gardner, Frank H.; and Kittle, Carl E., to Deere & Company. Control mechanism with adjustable floating cam. 4,348,917, Cl. 74-568.00R.

Garner, Robert; and Petitpierre, Jean C. Copying material employing fluoran color formers. 4,349,218, Cl. 282-27.500.

Garner, Robert; and Whitehead, Michael J., to Giba-Geigy Corporation. Pyrrolidino and piperidino benz ring substituted phthalides. 4,349,679, Cl. 546-196.000.

Garrett Corporation, The: *See—*
Erwin, John R., 4,349,314, Cl. 415-181.000.

Gasc, Jean-Claude: *See—*
Gouin d'Ambrieres, Solange; Lutz, Andre; and Gasc, Jean-Claude, 4,349,545, Cl. 424-180.000.

Gastmeier, William J., to Unitron Industries Limited. Acoustical damping element and method of forming same. 4,349,082, Cl. 181-130.000.

Geary, Carl H., Jr., to Carrier Corporation. Apparatus for securing a wheel to a rotatable shaft of a turbomachine. 4,349,291, Cl. 403-15.000.

Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See—*
Mueller, H. Richard, 4,348,885, Cl. 73-1.00B.

Gebrueder Loepfe AG: *See—*
Loepfe, Erich, 4,349,784, Cl. 328-138.000.

GEC Mechanical Handling Limited: *See—*
Barber, Norman R., 4,349,179, Cl. 254-270.000.

Geisthoff, Hubert, to Jean Walterscheid GmbH. Device for coupling and uncoupling a universal joint shaft. 4,349,092, Cl. 192-67.00R.

Gelius, Siegfried, to Optische Werke G. Rodenstock. Process and apparatus for the dynamic or static perimetry of the human eye. 4,349,250, Cl. 351-32.000.

General Electric Company: *See—*
Bain, Benjamin H., Jr., 4,349,240, Cl. 339-103.00R.
Brunelle, Daniel J.; and Smith, William E., 4,349,486, Cl. 260-463.000.
Ching, Ta-Yen, 4,349,602, Cl. 428-331.000.
Ching, Ta-Yen, 4,349,607, Cl. 428-412.000.
Cline, Harvey E., 4,349,621, Cl. 430-311.000.
Costas, John P., 4,349,915, Cl. 375-40.000.
Gustafson, Ralph W., 4,349,807, Cl. 337-360.000.
Hallgren, John E., 4,349,485, Cl. 260-463.000.
Levinson, Lionel M., 4,349,496, Cl. 264-61.000.
Mark, Victor; and Hedges, Charles V., 4,349,658, Cl. 528-176.000.
Mundy, Joseph L.; Porter, Gilbert B., III; and Cipolla, Thomas M., 4,349,277, Cl. 356-376.000.
Steele, Douglas S., 4,349,274, Cl. 356-1.000.
Takekoshi, Tohru; and Webb, Jimmy L., 4,349,479, Cl. 260-326.00N.
Theroux, Jean P., 4,349,831, Cl. 357-74.000.
Tomson, James M., 4,348,791, Cl. 29-598.000.
Weiss, Herbert W., 4,349,772, Cl. 318-799.000.

General Foods Corporation: *See—*
Stefanucci, Arthur; and Protomastro, Michael G., 4,349,573, Cl. 426-388.000.

General Instrument Corporation: *See—*
Sapitowicz, Thomas P.; and Meloni, Robert A., 4,349,283, Cl. 400-124.000.

General Kinematics Corporation: *See—*
Musschoot, Albert, 4,348,867, Cl. 62-64.000.

General Mills, Inc.: *See—*
Huston, Larry; Morrison, Clifton H.; Rasmussen, Glenn; and Tsuchiya, Takuzo, 4,348,923, Cl. 83-23.000.

General Motors Corporation: *See*—
Micheli, Adolph L.; and Kuo, Wey-Chaung, 4,349,709, Cl. 200-19.00R.

General Signal Corporation: *See*—
Molnar, John P., 4,349,866, Cl. 362-263.000.
Zahid, Abduz, 4,348,792, Cl. 29-157.00R.

Genthe, James E.: *See*—
Macaluso, Paul J.; and Genthe, James E., 4,349,132, Cl. 222-156.000.

Gernelle, Francois, to Compagnie Internationale pour l'Informatique CII Honeywell Bull. Printer having acoustic head locating system. 4,349,285, Cl. 400-320.000.

Geschka, Hugo W.; and Beitecke, Bernd, to Luk Lamellen und Kupplungsbau GmbH. Automatic towel dispenser. 4,348,877, Cl. 68-13.00R.

Gestetner Manufacturing Limited: *See*—
Daintrey, Joseph W., 4,348,979, Cl. 118-688.000.

Geurts, Martinus F. A. M., to U.S. Philips Corporation. Switching circuit comprising a plurality of input channels and an output channel. 4,349,750, Cl. 307-243.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; and Beyer, Herbert, 4,349,229, Cl. 299-32.000.

Geyer, Robert A.: *See*—
Swanson, Albert S.; and Geyer, Robert A., 4,348,783, Cl. 15-320.000.

Giba-Geigy Corporation: *See*—
Garner, Robert; and Whitehead, Michael J., 4,349,679, Cl. 546-196.000.

Gibbons, Ralph D., to Lansing Bagnall Limited. Method for the production of wiring looms. 4,348,805, Cl. 29-857.000.

Gibson, James D. M.: *See*—
Masri, Merle S.; Robinson, Brian; and Gibson, James D. M., 4,349,347, Cl. 8-139.000.

Giese, Gene E. Retirement elongation indicator for mast raising lines. 4,348,907, Cl. 73-862.390.

Giesecke, Heinz: *See*—
Raue, Roderich; and Giesecke, Heinz, 4,349,670, Cl. 542-417.000.

Gilbert, David J.; and Hollingsbee, Derek A., to Smith and Nephew Associated Companies Limited. Pharmaceutical compositions. 4,349,563, Cl. 424-274.000.

Gilbert, Donald R. Diver tow compressor unit. 4,348,976, Cl. 114-270.000.

Gilden, Morton, to Maryland Cup Corporation. Method for manufacturing two-piece containers from filled thermoplastic sheet material. 4,349,400, Cl. 156-217.000.

Gillis, Philip W., to Bell Telephone Laboratories, Incorporated. Digital multifrequency signal generator. 4,349,704, Cl. 179-84.0VF.

Gillone, Walter: *See*—
Bovio, Michele; Barbero, Aquilino; Gillone, Walter; and Berruti, Pierangelo, 4,349,829, Cl. 346-140.00R.

Gillum, Richard R., to ARES, Inc. Two stage shell feeding apparatus with shell feeding path control. 4,348,938, Cl. 89-33.0BA.

Glassman, Stephen M.; Kia, James D.; and Ryding, Paul A., to KRG, Inc. Livestock splint. 4,349,016, Cl. 128-87.00R.

Glock, Johann: *See*—
Knotik, Karl; Leichter, Peter; and Glock, Johann, 4,349,412, Cl. 159-47.0WL.

Glomski, Gunter: *See*—
Beerwald, Hans; Bohm, Gunter; and Glomski, Gunter, 4,349,582, Cl. 427-38.000.

Gloor, Hans: *See*—
Schmid, Markus; and Gloor, Hans, 4,349,066, Cl. 164-453.000.

Goedert, Ferdinand: *See*—
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; and Lorang, Lucien, 4,349,382, Cl. 75-60.000.

Goeke, George L.: *See*—
Jorgensen, Robert J.; Goeke, George L.; and Karol, Frederick J., 4,349,648, Cl. 526-125.000.

Goeuriot, Patrice M. V.: *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,348,980, Cl. 118-717.000.

Gold, Elijah H.; and Chang, Wei K., to Schering Corporation. (S)-8(1-Adamantanecarbonyloxy)-7-chloro-3-methyl-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine. 4,349,472, Cl. 260-239.0BB.

Goldberg, Arthur H.: *See*—
Mlodozeniec, Arthur R.; and Goldberg, Arthur H., 4,349,531, Cl. 424-27.000.

Goldmann, Siegfried, to Bayer Aktiengesellschaft. 4,4-Disubstituted spiro-1,4-dihydropyridines and a process for their production. 4,349,675, Cl. 546-17.000.

Goldstein, Richard; and Schornack, Louis W., to Dynascan Corporation. Timer and power control system. 4,349,748, Cl. 307-132.00E.

Golinelli, Guido: *See*—
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,348,814, Cl. 33-178.00E.

Gooch, Kendrick J., to USM Corporation. Cross axis mechanism. 4,348,952, Cl. 100-158.00R.

Goodnow, Warren H.; and Payne, John R., to Kaiser Aluminum & Chemical Corporation. Aluminum reduction cell electrode. 4,349,427, Cl. 204-243.00R.

Goodyear Tire & Rubber Company, The: *See*—
Stalter, Joseph F.; and Felten, Gilbert A., 4,349,406, Cl. 156-416.000.
Stan, Aurel V., 4,348,898, Cl. 374-124.000.

Goor, Gustaaf; and Kunkel, Wolfgang, to Degussa Aktiengesellschaft. Process for the production of hydrogen peroxide. 4,349,526, Cl. 423-588.000.

Gordon, Bruce E., to Raytheon Company. Digital memory system. 4,349,918, Cl. 455-20.000.

Gossler, Gerhard, to E.G.O. Electro-Gerate Blanc und Fischer. Control device for electric heating apparatus. 4,349,726, Cl. 219-511.000.

Goto, Mikio: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Goto, Mikio; and Kondo, Yukio, 4,349,509, Cl. 422-57.000.

Goto, Toshiki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,349,581, Cl. 427-34.000.

Gotoh, Hiroshi: *See*—
Takahashi, Fumitaka; and Gotoh, Hiroshi, 4,348,900, Cl. 73-505.000.

Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Suction mixture control system for vehicle engines. 4,349,005, Cl. 123-571.000.

Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Suction mixture control system for vehicle engines. 4,349,006, Cl. 123-571.000.

Gouin d'Ambrieres, Solange; Lutz, Andre; and Gasc, Jean-Claude, to Roussel Uclaf. Novel erythromycin a derivatives. 4,349,545, Cl. 424-180.000.

Goumondy, Jean-Pierre: *See*—
Brugere, Christiane; Goumondy, Jean-Pierre; Morel, Jean-Marie; and Zellner, Edmond, 4,349,453, Cl. 252-627.000.

Graeff, Norwood C.: *See*—
Cobaugh, Robert F.; and Graeff, Norwood C., 4,349,237, Cl. 339-65.000.

Grant, Edward J., Jr.; Scott, William H.; and Stipanuk, John M., to Sunbeam Corporation. Modular hand mixer. 4,349,758, Cl. 310-68.00A.

Grassmann, Peter; Dietz, Kurt; and Meinel, Friedrich, to Siemens Aktiengesellschaft. Apparatus for displaying fluoroscopic tomographic images of the body. 4,349,740, Cl. 378-25.000.

Gray, Joseph E.: *See*—
Schwan, Thomas J.; Burch, Homer A.; and Gray, Joseph E., 4,349,677, Cl. 546-142.000.

Gray, Theodore F.: *See*—
Davis, Burns; Gray, Theodore F.; and Musser, Harry R., 4,349,469, Cl. 524-765.000.

Great Lakes Chemical Corporation: *See*—
Dentel, David A.; and Sanders, David C., 4,349,488, Cl. 260-465.00D.

Green, David T., to United States Surgical Corporation. Surgical stapling apparatus having self-contained pneumatic system for completing manually initiated motion sequence. 4,349,028, Cl. 128-305.000.

Griesser, Walter, to Zahnradfabrik Friedrichshafen AG. Clutch assembly for gear transmission. 4,349,090, Cl. 192-53.00G.

Griffel, Gilbert W., Jr.: *See*—
Wright, Kenneth N.; and Griffel, Gilbert W., Jr., 4,349,578, Cl. 426-630.000.

Griggs, Allen L., to Minnesota Mining and Manufacturing Company. Powdered blend of epoxy resin and anhydride containing hindered nitrogen-containing compound. 4,349,645, Cl. 525-120.000.

Grimm, German. Arrangement for detecting disturbances influencing the network frequency in electric power supply systems and use of such arrangement in an adaptive automatic frequency control system for an electric power supply system. 4,349,878, Cl. 364-484.000.

Grimm, Thomas H.: *See*—
Smith, Jay, III; Schneider, Thomas G.; and Grimm, Thomas H., 4,349,196, Cl. 273-1.0GC.

Groen, Harm Jan: *See*—
Huisman, Hendrikus F.; and Groen, Harm Jan, 4,349,385, Cl. 106-37.000.

Grohmann, Andreas: *See*—
Moll, Hans-Georg; Grohmann, Andreas; Hasselbarth, Ulrich; and Marks, Helmuth, 4,349,441, Cl. 210-512.100.

Grollimund, Everett C.: *See*—
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.

Gross, James R., to Abbott Laboratories. Epidural needle catheter and adapter. 4,349,023, Cl. 128-214.400.

Grossner, Horst; Weiger, Gunter; and Schwegler, Gunter, to Daimler-Benz Aktiengesellschaft. Frequency generator. 4,349,746, Cl. 307-106.000.

Groupement d'Interet Economique Valpron: *See*—
Segard, Emile-Pierre; and Lebeault, Jean-Michel, 4,349,570, Cl. 426-52.000.

Gsell, Laurenz: *See*—
Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,349,567, Cl. 424-305.000.

GTE Automatic Electric Laboratories, Inc.: *See*—
Kwok, Sai W., 4,349,795, Cl. 333-176.000.

GTE Products Corporation: *See*—
French, Kenneth; and Piorkow, Alfred, 4,349,278, Cl. 356-394.000.
Long, Robert A.; and Fan, Albert K., 4,349,518, Cl. 423-308.000.

Guelden, Ronald H., to Bell Telephone Laboratories, Incorporated. Weatherproof electrical jack assembly. 4,349,236, Cl. 339-44.00M.

Guerineau, Abel A. J.: *See*—
Berlivet, Marc A.; and Guerineau, Abel A. J., 4,348,857, Cl. 56-192.000.

Guhne, Wieland: *See*—
Simm, Hans-Peter; Guhne, Wieland; and Hoffmann, Klaus, 4,349,206, Cl. 277-207.00R.
Guillard, Michel G.: *See*—
Bilet, Claude D.; Guillard, Michel G.; and Hedoin, Dominque A., 4,349,170, Cl. 246-63.000.
Gulf Research & Development Company: *See*—
Beach, David L.; and Zambelli, Adolfo, 4,349,483, Cl. 260-448.00A.
Gulich, Peter: *See*—
Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, 4,349,718, Cl. 219-78.010.
Gunter, Thomas G.; Zolnowsky, John E.; and Crudele, Lester M., to Motorola, Inc. Microprocessor interrupt processing. 4,349,873, Cl. 364-200.000.
Gunther, John E.: *See*—
Hoffman, William C.; Gunther, John E.; and Lichty, William R., 4,349,817, Cl. 340-784.000.
Gustafson, Ralph W., to General Electric Company. Heating and cooling thermostat with adjustable limits and methods of manufacturing and operating the thermostat. 4,349,807, Cl. 337-360.000.
Gustafsson, Berth U., to AB Bonnierforetagen. Helical gear machine with regulated outlet. 4,348,865, Cl. 60-493.000.
Gut, Edwin; Arnold, Erwin; Maugweiler, Gottfried; and Friedli, Hans, to Swiss Aluminium Ltd. Chisel alignment unit for a crust breaking facility. 4,349,231, Cl. 299-69.000.
Haga, Takahiro: *See*—
Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Nakajima, Toshio, 4,349,681, Cl. 546-304.000.
Hagan, Nancy C.: *See*—
Cyr, Clifford R.; and Hagan, Nancy C., 4,349,620, Cl. 430-259.000.
Hagberg, Carl E., to Intermatch S.A. Body having through holes and a method for manufacturing said body. 4,348,830, Cl. 46-26.000.
Hager and Allison Corp.: *See*—
Allison, Clint, 4,348,948, Cl. 99-339.000.
Hagiwara, Taiken: *See*—
Ishii, Shoichi; Hagiwara, Taiken; and Shimanuki, Masanobu, 4,349,848, Cl. 360-66.000.
Halbach & Braun: *See*—
Braun, Ernst; Braun, Gert; and Wetzchewald, Karlheinz, 4,349,232, Cl. 299-92.000.
Hall, Hugh E., Jr., to Halliburton Company. Digital acoustic logging method and apparatus. 4,349,896, Cl. 367-26.000.
Haller, Albert H.: *See*—
Dinella, Donald; Haller, Albert H.; and Polakowski, Theodore D., Jr., 4,349,589, Cl. 427-359.000.
Haller, Ingo: *See*—
Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, 4,349,560, Cl. 424-273.00R.
Hallewell, Robert A.: *See*—
Carey, Norman H.; Emtage, John S.; Tacon, William C. A.; and Hallewell, Robert A., 4,349,629, Cl. 435-172.000.
Hallgren, John E., to General Electric Company. Catalytic aromatic carbonate process using manganese tetradentate redox co-catalysts. 4,349,485, Cl. 260-463.000.
Halliburton Company: *See*—
Hall, Hugh E., Jr., 4,349,896, Cl. 367-26.000.
Halvorsen, Sigbjorn T.: *See*—
Olsen, Asbjorn L.; and Halvorsen, Sigbjorn T., 4,349,390, Cl. 148-6.15R.
Hamada, Satosi: *See*—
Hiramatsu, Toru; Koseki, Teruo; Hamada, Satosi; and Sumida, Atsushi, 4,349,523, Cl. 423-447.400.
Hamburger, Herman; and Dillingham, Robert G., to Zokor Corporation. Tunnel boring machine. 4,349,230, Cl. 299-33.000.
Hamlyn, Maxwell C., to Allied Chemical Corporation. Continuous spin-draw polyester process. 4,349,501, Cl. 264-210.300.
Hanabata, Makoto: *See*—
Kato, Yasuyuki; Sugimoto, Hiroaki; and Hanabata, Makoto, 4,349,659, Cl. 528-193.000.
Hanamura, Shoji: *See*—
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.
Handa, Mitsuaki: *See*—
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.
Haney, Thomas A.: *See*—
Morcos, Nabil A.; Haney, Thomas A.; and Wedeking, Paul W., 4,349,529, Cl. 424-1.000.
Hanss, Maxime F. Apparatus and a process for determining the rheological properties of biological fluids. 4,348,890, Cl. 73-61.400.
Hapad, Inc.: *See*—
Crooks, David R., 4,348,837, Cl. 51-5.00R.
Hara, Hiroo; and Taguchi, Noboru, to Nippon Electric Co., Ltd. Gas laser tube comprising a channel-shaped holder pair for compressively holding a brewster plate at plate corners. 4,349,908, Cl. 372-103.000.
Hara, Kazumasa: *See*—
Kasuga, Noboru; Hara, Kazumasa; and Koike, Mikio, 4,348,969, Cl. 112-184.000.
Harada, Kunihiro: *See*—
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,349,619, Cl. 430-196.000.
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Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Harder, Wolfgang, 4,349,484, Cl. 260-453.00P.
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda. Shredding machines. 4,349,159, Cl. 241-236.000.
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Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,349,619, Cl. 430-196.000.
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Bolen, Charles E.; Harrington, Edward R.; Marzocchi, Alfred; and Roberts, Michael G., 4,349,590, Cl. 427-389.700.
Harrington, Gene N.: *See*—
Fine, Jerome; and Harrington, Gene N., 4,349,597, Cl. 428-95.000.
Harris, Albert; and Spector, George. Stop box peak light. 4,348,922, Cl. 81-180.00R.
Harris, David P. Garlic press. 4,348,950, Cl. 99-510.000.
Harris, Eleanor S., to United States of America, Navy. Around-a-mast quadrifilar microstrip antenna. 4,349,824, Cl. 343-700.0MS.
Hart, Arthur C., Jr.: *See*—
Aloisio, Charles J., Jr.; Blyler, Lee L., Jr.; Brockway, George S.; Hart, Arthur C., Jr.; and Taylor, Carl R., 4,349,587, Cl. 427-163.000.
Hart, Robert P.: *See*—
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,349,882, Cl. 364-509.000.
Hartman, Adrian R.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Control circuitry using a pull-down transistor for high voltage solid-state switches. 4,349,751, Cl. 307-252.00A.
Hartmann, Bernd; and Meinhold, Henner, to Brown, Boveri & Cie Aktiengesellschaft. Circuit for protecting storage cells. 4,349,773, Cl. 320-5.000.
Hartmann, Ewald, to Clouth Gummiwerke Aktiengesellschaft. Wear resistant wheel for endless track. 4,349,234, Cl. 305-56.000.
Hartmann, Werner, to Harwe AG. Catalyst for the preparation of polylactams. 4,349,460, Cl. 252-431.00N.
Hartmannsgruber, Max, to Zinser Textilmaschinen GmbH, Firma. Spinning or twisting machine. 4,348,860, Cl. 57-100.000.
Hartsog, Clarence E. Solar operated shutter. 4,349,011, Cl. 126-419.000.
Haruch, James; and Williams, Robert, to Spraying Systems Company. Efficiency nozzle. 4,349,156, Cl. 239-432.000.
Haruna, Tohru: *See*—
Nakahara, Yutaka; and Haruna, Tohru, 4,349,468, Cl. 524-302.000.
Harvey, Francis K.; Franks, Larrabee; and Ingraham, David L. Disposable ashtray. 4,349,036, Cl. 131-240.00R.
Harvey, Keith W.: *See*—
Hughes, Charles W.; Harvey, Keith W.; and Sonneborn, Walter G. O., 4,349,316, Cl. 416-104.000.
Harvey, William. Cassette tape monitor. 4,349,850, Cl. 360-74.200.
Harwe AG: *See*—
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Ishiwata, Shoji; Kuroda, Yasuo; Tanaka, Shoichi; Watanabe, Tsuneo; and Hasegawa, Shinichi, 4,349,513, Cl. 423-12.000.
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Tsurunaga, Yasuaki; Abe, Masaru; Hashimoto, Hideaki; and Tsuzura, Junichi, 4,349,062, Cl. 152-356.00R.
Hashimoto, Masashi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Hashimoto, Shigeru: *See*—
Kobayashi, Kazufumi; and Hashimoto, Shigeru, 4,349,265, Cl. 354-286.000.
Haslbeck, Joseph, to Highland Mfg. Company, Ltd. Eye protector. 4,348,775, Cl. 2-452.000.
Hasselbarth, Ulrich: *See*—
Moll, Hans-Georg; Grohmann, Andreas; Hasselbarth, Ulrich; and Marks, Helmuth, 4,349,441, Cl. 210-512.100.
Hastings, Otis H. Transaction security system and modular transaction processing center. 4,348,966, Cl. 109-2.000.
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Tanaka, Yoshio; Nishikawa, Yasuhisa; and Hasumi, Ryoichi, 4,348,911, Cl. 74-10.330.
Hatfield, Efton E.: *See*—
Larson, Roger R.; and Hatfield, Efton E., 4,349,572, Cl. 426-335.000.
Haubold, Axel D.: *See*—
Ellis, Willard H.; Haubold, Axel D.; Slivenko, Victor; and Bokros, Jack C., 4,349,498, Cl. 264-81.000.
Hauni-Werke Korber & Co. KG: *See*—
Thamerus, Theobald, 4,349,096, Cl. 198-347.000.
Hauser, Allan H. Single flower stem cutter. 4,348,832, Cl. 47-1.00R.
Hausler, Kenneth J. Method of promoting suntan using a cream containing zinc and copper salts. 4,349,536, Cl. 424-59.000.

Hayakawa, Yoshihiro: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, 4,348,902, Cl. 73-626.000.

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Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; and Hayashi, Mitsuo, 4,349,667, Cl. 536-13.900.

Hayashida, Yoshihiro, to Tokico Ltd. Master cylinder. 4,348,866, Cl. 60-561.000.

Hayes, Paul R. Scented disposal bag. 4,349,104, Cl. 206-205.000.

Haynes, Anthony C.; and Unwin, Derek K., to Sussex Instruments Limited. Measuring sheet thickness. 4,348,889, Cl. 73-37.700.

Healey, William E.; and Heineman, Morse R., to W. E. Healey and Associates, Inc. Multiple detector alarm latch and release system. 4,349,812, Cl. 340-522.000.

Heckler & Koch GmbH: *See—*
Ketterer, Dieter; Jakubaschk, Horst; and Rommel, Emil, 4,348,941, Cl. 89-155.000.

Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,349,658, Cl. 528-176.000.

Hedoin, Dominque A.: *See—*
Bilet, Claude D.; Guillard, Michel G.; and Hedoin, Dominque A., 4,349,170, Cl. 246-63.000.

Heineman, Morse R.: *See—*
Healey, William E.; and Heineman, Morse R., 4,349,812, Cl. 340-522.000.

Heino, Jorgen, to Procter & Gamble Company, The. Container for liquid with non-drip measuring cap closure. 4,349,056, Cl. 141-381.000.

Hellriegel, Walter, to Jenoptik Jena GmbH. High quality objective using air bearing. 4,349,244, Cl. 350-255.000.

Hemingway, Bruce R.: *See—*
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce R., 4,349,111, Cl. 209-534.000.

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Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.

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Cairns, Neil S.; and Hendershott, Loyd, 4,348,843, Cl. 52-167.000.

Henderson, John G. N., to RCA Corporation. Apparatus for automatically steering an electrically steerable television antenna. 4,349,840, Cl. 358-188.000.

Hendrix, Randle L. Loose material retainer strip. 4,349,596, Cl. 428-83.000.

Hendrix, Tony D.; and Tedeschi, Rinaldo R., to United Technologies Corporation. Relative compression of an asymmetric internal combustion engine. 4,348,893, Cl. 73-116.000.

Henning, Walter; and Illig, Heinz-Peter, to Zimmerman, Jos. Coil carrier with carrier elements extending parallel to its axis. 4,349,165, Cl. 242-118.110.

Henriksson, Stig R., to Atlas Copco Aktiebolag. Hydraulically operated impact motor. 4,349,075, Cl. 173-134.000.

Henrion, Romain: *See—*
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; and Lorang, Lucien, 4,349,382, Cl. 75-60.000.

Heppler, Fred A. Daily injection site guide assembly. 4,349,338, Cl. 434-262.000.

Hepworth, Paul S.; and Whitehouse, Martin G., to Plas Plugs Limited. Blade holders. 4,349,059, Cl. 145-33.00A.

Heraeus Quarzschmelze GmbH: *See—*
Schulke, Karl A., 4,349,203, Cl. 277-26.000.

Hercules Incorporated: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,349,641, Cl. 524-458.000

Hermann Berstorff Maschinenbau GmbH: *See—*
Brand, Wilhelm; and Baasner, Dietmar, 4,348,811, Cl. 33-125.00R.

Hermann C. Starck Berlin: *See—*
Muller, Wolfgang, 4,349,515, Cl. 423-58.000.

Herring, William T. Gang slat animal shelter flooring with foraminous inserts, and method of constructing same. 4,348,987, Cl. 119-20.000.

Herrmann, John L., Jr.: *See—*
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,349,559, Cl. 424-273.00P.

Hertzenberg, Elliot P.: *See—*
Dent, Anthony L.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,349,533, Cl. 424-52.000.

Hesston Corporation: *See—*
Berlivet, Marc A.; and Guerineau, Abel A. J., 4,348,857, Cl. 56-192.000.

Heubach, Edward C., to Owens-Corning Fiberglas Corporation. Crown vents. 4,349,332, Cl. 432-179.000.

Hewlett-Packard Company: *See—*
Ackley, Donald E., 4,349,905, Cl. 372-46.000.
Brown, Troy L., 4,349,868, Cl. 364-157.000.
Podell, Allen F.; and Mueller, Louis F., 4,349,798, Cl. 333-230.000.

Hey, Robert W.: *See—*
Davis, Earl K.; and Hey, Robert W., 4,349,692, Cl. 174-52.00H.

Hibi, Kunio: *See—*
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.

Hicinbothem, Walter A., Jr.: *See—*
Tarng, Ming L.; and Hicinbothem, Walter A., Jr., 4,349,408, Cl. 156-628.000.

Higashi, Akio: *See—*
Kawashiri, Kazuhiro; Mizobuchi, Yuzo; Higashi, Akio; Tamura, Hiroshi; Takeda, Keiji; and Nagata, Masayoshi, 4,349,617, Cl. 430-59.000.

Higashiyama, Noboru; and Sasaki, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head supporting mechanism for a magnetic disc apparatus. 4,349,851, Cl. 360-105.000.

Highland Mfg. Company, Ltd.: *See—*
Haslbeck, Joseph, 4,348,775, Cl. 2-452.000.

Hill, David G.: *See—*
Crossley, Roger; and Hill, David G., 4,349,555, Cl. 424-263.000.

Hill, Kenneth W. Bulk ice bin. 4,348,872, Cl. 62-459.000.

Himmelmann, Wolfgang: *See—*
Sobel, Johannes; Himmelmann, Wolfgang; and Bergthaller, Peter, 4,349,624, Cl. 430-622.000.

Hinds, Charles M., to Spar Aerospace Limited. Satellite servicing. 4,349,837, Cl. 358-93.000.

Hinrichs, Fritz, to Siemens Aktiengesellschaft. Apparatus for sealing an electrical component. 4,349,693, Cl. 174-52.0PE.

Hipp, Johann F., to Wegman & Co. Mechanical-optoelectronic angle comparator for determination of the angular position of a weapon mounted by a combat vehicle relative to the line of sight. 4,348,939, Cl. 89-41.0ME.

Hiraga, Yoichi; Watanabe, Osamu; and Nakatani, Masaki, to Toyo Soda Manufacturing Company, Ltd. Purification of wet process phosphoric acid. 4,349,519, Cl. 423-321.00S.

Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, to Bridgestone Tire Company Limited. Pneumatic radial tires for passenger cars having a low rolling resistance. 4,349,061, Cl. 152-209.00R.

Hiramatsu, Toru; Koseki, Teruo; Hamada, Satosi; and Sumida, Atsushi, to Toray Industries, Inc. Process for producing carbon fiber of improved oxidation resistance. 4,349,523, Cl. 423-447.400.

Hirata, Masao, to Konishiroku Photo Industry Co., Ltd. Electrostatic image-forming process and an apparatus therefor. 4,349,268, Cl. 355-4.000.

Hirohata, Michio: *See—*
Tezuka, Nobuo; and Hirohata, Michio, 4,349,264, Cl. 354-234.000.

Hirose, Akira, to Ricoh Co., Ltd. Opening and closing apparatus. 4,348,786, Cl. 16-75.000.

Hirsch, Ronald W. Firewood rack and carrier. 4,349,213, Cl. 280-638.000.

Hisatsugu, Tokushige: *See—*
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, 4,349,409, Cl. 156-643.000.

Hishida, Tadashi: *See—*
Okada, Tsutomu; Hishida, Tadashi; and Muramatsu, Minoru, 4,349,625, Cl. 435-4.000.

Hitachi, Ltd.: *See—*
Akitake, Isao; Noda, Tsutomu; and Yamazaki, Kazuhiko, 4,349,696, Cl. 179-1.0GS.
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Misumi, Akira; and Fukushima, Hiroshi, 4,349,766, Cl. 313-346.00R.
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Fukasawa, Sigeru; and Mizokawa, Sadao, 4,349,872, Cl. 364-200.000.
Kugo, Masaru; and Igarashi, Osamu, 4,349,810, Cl. 340-79.000.
Miyake, Kiyoshi; and Miyata, Naoyuki, 4,349,425, Cl. 204-192.00P.
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.
Oyama, Yoshishige; and Kuroiwa, Hiroshi, 4,349,877, Cl. 364-431.050.
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Sugahara, Kenshi; and Mori, Junji, 4,349,426, Cl. 204-195.00M.
Suzuki, Ryo; Uehara, Keiichi; Takeuchi, Teruaki; and Takeshita, Masatoshi, 4,349,892, Cl. 365-8.000.
Tonomura, Kenichi; Takahashi, Kyoichi; and Furihata, Makoto, 4,349,834, Cl. 358-27.000.

Hitachi Maxell, Ltd.: *See—*
Shimizu, Jozo; Yamaguchi, Satoru; and Aoyama, Shigeo, 4,349,608, Cl. 428-413.000.

Hitachi Microcomputer Engineering Ltd.: *See—*
Tonomura, Kenichi; Takahashi, Kyoichi; and Furihata, Makoto, 4,349,834, Cl. 358-27.000.

Ho, Chung W.: *See—*
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Hobart Corporation: *See—*
Berner, George J., 4,349,731, Cl. 235-489.000.

Hochtemperatur-Reaktorbau GmbH.: *See—*
Schoening, Josef; Elter, Claus; and Schmitt, Hermann, 4,349,507, Cl. 376-230.000.

Hoechst Aktiengesellschaft: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Schaffelhofer, Iwo, 4,349,417, Cl. 203-33.000.
Schell, Loni, 4,349,391, Cl. 148-6.15R.

Hoffman, William C.; Gunther, John E.; and Lichty, William R. Liquid crystal display system using fiber optic faceplates. 4,349,817, Cl. 340-784.000.
Hoffmann, Benjamin. Man-propelled hydrofoil boat. 4,349,340, Cl. 440-30.000.
Hoffmann, Klaus: *See—*
Simm, Hans-Peter; Guhne, Wieland; and Hoffmann, Klaus, 4,349,206, Cl. 277-207.00R.
Hoffmann-La Roche Inc.: *See—*
Berger, Leo; and Olson, Gary L., 4,349,678, Cl. 546-150.000.
Kyburz, Emilio; and Aschwanden, Werner, 4,349,562, Cl. 424-274.000.
Mlodozeniec, Arthur R.; and Goldberg, Arthur H., 4,349,531, Cl. 424-27.000.
Montavon, Marc; and Reiner, Roland, 4,349,672, Cl. 544-027.000.
Walser, Armin; and Fryer, Rodney I., 4,349,475, Cl. 260-244.400.
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Hohman, Charles M.: *See—*
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Hohn, Herbert: *See—*
Schneider, Franz; Schumann, Burkhard; Maier, Karl; and Hohn, Herbert, 4,349,310, Cl. 414-749.000.
Holden, M. James, to Mobil Oil Corporation. Packaging tray. 4,349,146, Cl. 229-2.50R.
Hollingsbee, Derek A.: *See—*
Gilbert, David J.; and Hollingsbee, Derek A., 4,349,563, Cl. 424-274.000.
Holloway, John A., to B. F. Goodrich Company, The. Polyurethane process. 4,349,657, Cl. 528-66.000.
Holmes, William A.: *See—*
Friedman, Melvin; and Holmes, William A., 4,349,257, Cl. 354-126.000.
Holthusen, Bernd, to Dr. Boger Duplomat Apparate KG (GmbH & Co.). Circuit arrangement for controlling the exposure time of reproduction cameras. 4,349,272, Cl. 355-69.000.
Holzbaur, Siegfried; Barth, Horst; and Osmera, Josef, to Robert Bosch GmbH. Apparatus for mixture formation for internal combustion engines, in particular mixture-compressing engines having externally supplied ignition. 4,348,999, Cl. 123-452.000.
Homeyer, Bernhard: *See—*
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,005, Cl. 123-571.000.
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,006, Cl. 123-571.000.
Tagami, Katsutoshi; Senzaki, Takaya; Suzuki, Nobuhiko; and Murao, Eiji, 4,349,823, Cl. 343-7.0VM.
Takahashi, Fumitaka; and Gotoh, Hiroshi, 4,348,900, Cl. 73-505.000.
Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.): *See—*
Shimada, Junichi; and Ogawa, Kazutake, 4,349,078, Cl. 180-69.100.
Honeywell Information Systems Inc.: *See—*
Woods, William E.; Stanley, Philip E.; Cushing, David E.; and Lemay, Richard A., 4,349,874, Cl. 364-200.000.
Hooker Chemicals & Plastics Corp.: *See—*
Steele, Duane C., 4,349,448, Cl. 252-135.000.
Hopkins, Donald J.: *See—*
Wynn, Charles C.; and Hopkins, Donald J., 4,349,305, Cl. 414-408.000.
Hoppe, Frederick J.: *See—*
Buckstead, John W.; Hoppe, Frederick J.; and Williams, Dennis W., 4,349,308, Cl. 414-725.000.
Hoppe, Joachim A.: *See—*
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Horide, Fumio; Tsuji, Kozo; and Yoshida, Ryo, to Sumitomo Chemical Company, Limited. Emulsifiable concentrate for weed control. 4,349,379, Cl. 71-120.000.
Horiguchi, Satoru; Sasaoka, Takeshi; and Shimane, Koichi, to Dai Nippon Printing Co., Ltd.; and Ikegami Tsushinki Co., Ltd. Color printing process simulator. 4,349,835, Cl. 358-76.000.
Hornbeck, Sherman J.: *See—*
Blocksome, Roderick K.; Hornbeck, Sherman J.; and Fee, Donald R., 4,349,799, Cl. 333-246.000.
Hoshi, Hideo; Mitsugi, Shiro; Teruyama, Hiroichi; and Tabata, Hideo, to Kabushiki Kaisha Daini Seikosha. Tuning fork type quartz resonator. 4,349,763, Cl. 310-370.000.
Hoshi, Setsuo: *See—*
Ueno, Kazunori; Isobe, Masahiro; and Hoshi, Setsuo, 4,348,993, Cl. 123-146.50A.
Hosonuma, Masashi: *See—*
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,349,581, Cl. 427-34.000.
Howe, Dennis G., to Eastman Kodak Company. Apparatus and method for reading optical discs. 4,349,901, Cl. 369-45.000.
Hsu, Sheng T.: *See—*
Flatley, Doris W.; and Hsu, Sheng T., 4,349,584, Cl. 427-85.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Fungicidal N-(pyridazinoacetyl)-anilines. 4,349,550, Cl. 424-250.000.
Hughes, Charles W.; Harvey, Keith W.; and Sonneborn, Walter G. O., to Textron, Inc. Twist control for helicopter tail rotor pitch change. 4,349,316, Cl. 416-104.000.
Huisman, Hendrikus F.; and Groen, Harm Jan, to U.S. Philips Corporation. Method of preparing a FeOOH pigment. 4,349,385, Cl. 106-37.000.
Hullen, Helmut; and Knoth, Werner-Dieter, to Veba Glas A.G. Glassware-making apparatus with reject-catching chute and method of operating the apparatus. 4,349,368, Cl. 65-28.000.
Humpert, Jurgen, to Friedrich Grohe Armaturenfabrik GmbH & Co. Mixing valve. 4,349,149, Cl. 236-12.00R.
Hunt, Russell G.: *See—*
Cliff, Geoffrey R.; Hunt, Russell G.; and Percival, Albert, 4,349,378, Cl. 11-103.000.
Hunter, James B., to Johnson Matthey, Inc. Catalytic elements. 4,349,450, Cl. 252-466.0PT.
Hurt, Alfred A. Multi-purpose square. 4,348,815, Cl. 33-419.000.
Huston, Larry; Morrison, Clifton H.; Rasmussen, Glenn; and Tsuchiya, Takuzo, to General Mills, Inc. Method for severing portions from a plurality of frozen columns of fish or the like. 4,348,923, Cl. 83-23.000.
Hutchison, Donald W.: *See—*
Stein, John C.; and Hutchison, Donald W., 4,348,870, Cl. 62-140.000.
Hutchison, Joseph A., to Solar Kinetics, Inc. Method of installing a solar collector. 4,348,797, Cl. 29-434.000.
Hutchison, Joseph A., to Solar Kinetics, Inc. Method of manufacturing solar collector module. 4,348,798, Cl. 29-448.000.
Huvar, Robert J., to Occidental Chemical Corporation. Trivalent chromium passivate solution and process. 4,349,392, Cl. 148-6.200.
Hydroacoustics Inc.: *See—*
Bouyoucos, John V., 4,348,943, Cl. 91-355.000.
Hyer, Ronald C.: *See—*
Campillo, Anthony J.; Hyer, Ronald C.; and Shapiro, Stanley J., 4,349,907, Cl. 372-92.000.
Iannarelli, Anthony N. Thermally insulated masonry block. 4,348,845, Cl. 52-405.000.
Ibar, Jean-Pierre. Device for modifying or controlling the shape of an electrical output signal. 4,349,886, Cl. 364-573.000.
Ichikoh Industries Ltd.: *See—*
Koyama, Yukio; Kondo, Tsutomu; Matsuzaki, Mikio; and Akizuki, Kunio, 4,349,247, Cl. 350-302.000.
Ichimura, Masaaki; Tarumizu, Yasumasa; and Uranaka, Kiyouzi, to Kabushiki Kaisha Komatsu Seisakusho. Tank assembly for hydraulic system. 4,348,864, Cl. 60-454.000.
Ichinose, Yosaburo: *See—*
Ishibashi, Naoto; Taniguti, Ryosuke; Miyaji, Junichi; and Ichinose, Yosaburo, 4,349,813, Cl. 340-638.000.
Igarashi, Osamu: *See—*
Kugo, Masaru; and Igarashi, Osamu, 4,349,810, Cl. 340-79.000.
Iguchi, Eiko: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Iijima, Tashifumi: *See—*
Koitabashi, Takeo; Matsuzaka, Syozi; and Iijima, Tashifumi, 4,349,622, Cl. 430-567.000.
Ikeda, Nobumasa: *See—*
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,349,061, Cl. 152-209.00R.
Ikeda, Sunao: *See—*
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.
Ikegami Tsushinki Co., Ltd.: *See—*
Horiguchi, Satoru; Sasaoka, Takeshi; and Shimane, Koichi, 4,349,835, Cl. 358-76.000.
Ikenoue, Shinpei; Mifune, Hiroyuki; and Fuseya, Yoshiharu, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,349,623, Cl. 430-600.000.
Illig, Heinz-Peter: *See—*
Henning, Walter; and Illig, Heinz-Peter, 4,349,165, Cl. 242-118.110.
Imaging Technology Limited: *See—*
James, Paul M., 4,349,273, Cl. 355-72.000.
Imanaka, Hiroshi: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Imatomi, Keiichiro: *See—*
Takasaki, Masaru; and Imatomi, Keiichiro, 4,349,222, Cl. 285-363.000.
Imperial Chemical Industries Limited: *See—*
Rowe, Frederick; and Brown, David, 4,349,432, Cl. 208-130.000.
Schofield, John D., 4,349,389, Cl. 106-308.00Q.
Inasawa, Hideho; and Matsuoka, Hideoki, to Nissan Motor Company, Limited. Knee protector. 4,349,214, Cl. 280-752.000.
Ince, Norman J., to Kango Electric Hammers Limited. Convertible rotary impact hammer drill. 4,349,074, Cl. 173-48.000.
Incom International Inc.: *See—*
Patel, Jhina; and Zahuranec, Terry L., 4,349,363, Cl. 55-498.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Bovio, Michele; Barbero, Aquilino; Gillone, Walter; and Berruti, Pierangelo, 4,349,829, Cl. 346-140.00R.

Ingraham, David L.: *See*—
Harvey, Francis K.; Franks, Larrabee; and Ingraham, David L., 4,349,036, Cl. 131-240.00R.
Inoshita, Yasushi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,349,177, Cl. 251-230.000.
Inoue, Satoru: *See*—
Uematsu, Tamon; Inoue, Satoru; and Yamashita, Norihisa, 4,349,554, Cl. 424-258.000.
Inoue, Shinichi: *See*—
Toyokura, Nobuo; Tokunaga, Hiroshi; Inoue, Shinichi; Ishikawa, Hajime; and Shinoda, Masaichi, 4,349,395, Cl. 148-187.000.
Inouye, Shozo: *See*—
Takeda, Keiso; Inouye, Shozo; and Kashiwakura, Toshimi, 4,348,997, Cl. 123-445.000.
Intermatch S.A.: *See*—
Hagberg, Carl E., 4,348,830, Cl. 46-26.000.
International Business Machines Corporation: *See*—
Bajorek, Christopher H.; Chance, Dudley A.; and Ho, Chung W., 4,349,862, Cl. 361-401.000.
Bobart, Kevin L.; and Flurry, Gregory A., 4,349,741, Cl. 250-568.000.
Chang, David C., 4,349,890, Cl. 364-900.000.
Flurry, Gregory A.; Krieg, Michael L.; and Phillips, David W., 4,349,742, Cl. 250-568.000.
Kulynych, Larysa H.; Romankiw, Lubomyr T.; and von Gutfeld, Robert J., 4,349,583, Cl. 427-53.100.
International Chemical Engineering Establishment: *See*—
Bos, Arnold, 4,349,490, Cl. 264-25.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A., 4,349,449, Cl. 252-174.110.
International Harvester Company: *See*—
DePauw, Richard A.; and Staiert, Richard W., 4,348,855, Cl. 56-10.200.
Klem, John E., 4,349,046, Cl. 137-899.000.
Klem, John E., 4,349,307, Cl. 414-686.000.
International Standard Electric Corporation: *See*—
Drake, Cyril F., 4,349,025, Cl. 128-260.000.
Lucanera, Constantino, 4,349,826, Cl. 343-773.000.
Sterling, Henley F.; and Drake, Miles P., 4,349,373, Cl. 65-60.800.
International Telephone and Telegraph Corporation: *See*—
Chea, Ramon C. W., Jr., 4,349,703, Cl. 179-18.0HB.
Kim, Sung C.; and Schwartz, Marvin P., 4,348,794, Cl. 29-157.3AH.
Mohiuddin, Gulam, 4,349,643, Cl. 524-560.000.
November, Milton H.; Lyon, LaVern D.; and Ponzi, Joseph J., 4,349,881, Cl. 364-509.000.
Into, Kiyoshi: *See*—
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Ipco Hospital Supply Corporation: *See*—
Weissman, Bernard, 4,349,335, Cl. 433-225.000.
Weissman, Bernard, 4,349,336, Cl. 433-225.000.
Iqbal, Abul; and Lienhard, Paul, to Ciba-Geigy Corporation. Process for the production of metal complexes of isoindoline azines. 4,349,671, Cl. 542-417.000.
Irii, Shinsuke: *See*—
Iwasaki, Hiroshi; Irii, Shinsuke; and Kondo, Mitsuru, 4,349,454, Cl. 252-312.000.
Irioka, Kazuyoshi: *See*—
Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, 4,348,902, Cl. 73-626.000.
Ishibashi, Naoto; Taniguti, Ryosuke; Miyaji, Junichi; and Ichinose, Yosaburo, to Mitsubishi Denki Kabushiki Kaisha. Blown fuse sensor. 4,349,813, Cl. 340-638.000.
Ishida, Hiroaki: *See*—
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.
Ishida, Tokuji; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Automatic electronic flash device producing preliminary flash light and primary flash light. 4,349,260, Cl. 354-145.000.
Ishida, Toshihiko: *See*—
Tanaka, Kimio; and Ishida, Toshihiko, 4,349,166, Cl. 242-197.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Nakajima, Toshio, 4,349,681, Cl. 546-304.000.
Ishii, Fusao: *See*—
Muramoto, Shoichi; Tsukamura, Yoshihiro; Tozawa, Masayuki; and Ishii, Fusao, 4,349,767, Cl. 313-449.000.
Ishii, Shoichi; Hagiwara, Taiken; and Shimanuki, Masanobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Recording circuit. 4,349,848, Cl. 360-66.000.
Ishikawa, Hajime: *See*—
Toyokura, Nobuo; Tokunaga, Hiroshi; Inoue, Shinichi; Ishikawa, Hajime; and Shinoda, Masaichi, 4,349,395, Cl. 148-187.000.
Ishikawa, Hiroya: *See*—
Sekiguchi, Tomoyoshi; and Ishikawa, Hiroya, 4,349,077, Cl. 180-41.000.
Ishikawa, Soji. Medical needle assembly. 4,349,022, Cl. 128-214.00R.
Ishiwata, Shoji; Kuroda, Yasuo; Tanaka, Shoichi; Watanabe, Tsuneo; and Hasegawa, Shinichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for recovering uranium and/or thorium from a liquid containing uranium and/or thorium. 4,349,513, Cl. 423-12.000.
Isobe, Masahiro: *See*—
Ueno, Kazunori; Isobe, Masahiro; and Hoshi, Setsuo, 4,348,993, Cl. 123-146.50A.
Isogai, Hideaki, to Fujitsu Limited. Decoder circuit of a semiconductor memory device. 4,349,895, Cl. 365-230.000.
Ito, Koichi: *See*—
Toyoshima, Shigeshi; Sato, Ryuichi; Ito, Koichi; Shinohara, Toshio; and Yamamoto, Yasushi, 4,349,682, Cl. 548-110.000.
Ito, Takayoshi; Kubo, Seitoku; and Terakura, Yukio, to Aisin-Warner Kabushiki Kaisha. Device for controlling a lock-up clutch in an automatic transmission with a lock-up clutch equipped fluid torque converter. 4,349,088, Cl. 192-3.300.
Itoh, Katsumi: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Itoh, Susumu: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
ITT Industries, Inc.: *See*—
Michalski, Dieter, 4,349,712, Cl. 200-159.00B.
Ivanchev, Sergei S.: *See*—
Pavljuchenko, Valery N.; Pessina, Zinaida M.; Vasilieva, Elena D.; and Ivanchev, Sergei S., 4,349,649, Cl. 526-234.000.
Ivanko, Theodore: *See*—
Libertini, Zoltan L.; and Ivanko, Theodore, 4,349,318, Cl. 416-220.00R.
Iwahara, Makoto, to Victor Company of Japan, Limited. Audio signal translation with no delay elements. 4,349,698, Cl. 179-1.00G.
Iwaki, Katsutaro: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Iwamatsu, Seiichi: *See*—
Ogawa, Mitsuru; and Iwamatsu, Seiichi, 4,348,804, Cl. 29-580.000.
Iwanami, Teruo; Takida, Hiroshi; and Fujita, Yukio, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Melt-blended resin composition of hydrolyzed ethylene/vinyl acetate copolymers. 4,349,644, Cl. 525-57.000.
Iwasaki, Hiroshi; Irii, Shinsuke; and Kondo, Mitsuru, to Kanzaki Paper Manufacturing Company Limited. Preparation of aqueous medium suitable for preparing microcapsules. 4,349,454, Cl. 252-312.000.
Iwata Electric Co., Ltd.: *See*—
Iwata, Keisuke, 4,349,820, Cl. 340-825.710.
Iwata, Keisuke, to Iwata Electric Co., Ltd. Tone signal decoder. 4,349,820, Cl. 340-825.710.
Izawa, Ryuichi: *See*—
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.
Jackson, Dennis B., to Wiltshire Cutlery Company Proprietary Limited. Combination sharpener device and scissors. 4,348,809, Cl. 30-138.000.
Jacobi, Haireddin; Opitz, Wolfgang; and Etschenberg, Eugen, to Troponwerke GmbH & Co. KG. Histolytic agents and their use. 4,349,543, Cl. 424-177.000.
Jakubaschk, Horst: *See*—
Ketterer, Dieter; Jakubaschk, Horst; and Rommel, Emil, 4,348,941, Cl. 89-155.000.
James, Paul M., to Imaging Technology Limited. Electrophotographic printer exposure station. 4,349,273, Cl. 355-72.000.
Janauer, Gilbert E.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,349,646, Cl. 525-256.000.
Janome Sewing Machine Co. Ltd.: *See*—
Kasuga, Noboru; Hara, Kazumasa; and Koike, Mikio, 4,348,969, Cl. 112-184.000.
Janssen, Peter J. H.; and Christis, Wilhelmus J., to U.S. Philips Corporation. Error correction circuit using character probability. 4,349,904, Cl. 371-69.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,349,619, Cl. 430-196.000.
Matsumura, Yoshio; Nozue, Ikuo; and Ukachi, Takashi, 4,349,664, Cl. 528-491.000.
Jaworski, William R. Filtration system for spas, hot tubs, swimming pools and the like. 4,349,434, Cl. 210-94.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,349,092, Cl. 192-67.00R.
Jefferson, John R.; and Brown, Alexander G. M., to Lucas Industries Limited. Fuel pumping apparatus. 4,348,995, Cl. 123-366.000.
Jenkner, Erwin. Method and apparatus for trimming laminates. 4,348,924, Cl. 83-39.000.
Jennings, Stephen J.: *See*—
Reuther, John F.; Jennings, Stephen J.; and Yannone, Robert A., 4,349,744, Cl. 290-40.00C.
Jenoptik Jena GmbH: *See*—
Hellriegel, Walter, 4,349,244, Cl. 350-255.000.
Jensen, James R., to Container Corporation of America. Tray with integral locking tab. 4,349,147, Cl. 229-34.00R.
Joel, Amos E., Jr., to Bell Telephone Laboratories, Incorporated. Nodal switching network with binary order links. 4,349,702, Cl. 179-18.0GE.

John Wyeth & Brother Limited: *See—*
Crossley, Roger, 4,349,480, Cl. 260-326.200.
Crossley, Roger; and Hill, David G., 4,349,555, Cl. 424-263.000.
Johnson, David B.: *See—*
Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., 4,348,970, Cl. 112-256.000.
Johnson, Gorden F., to Pullman Incorporated. Sponge iron products sampling device. 4,348,910, Cl. 73-863.510.
Johnson & Johnson: *See—*
Ramsey, Maynard, III, 4,349,034, Cl. 128-681.000.
Thomas, Joseph J.; Vaillancourt, Vincent L.; Millet, Marcus J.; and Smith, William F., 4,349,035, Cl. 128-766.000.
Johnson & Johnson Baby Products Company: *See—*
Passafiume, Anthony, 4,349,140, Cl. 225-97.000.
Johnson Matthey, Inc.: *See—*
Hunter, James B., 4,349,450, Cl. 252-466.0PT.
Johnson, Michael F., to Champion Spark Plug Company. Spray nozzle. 4,349,153, Cl. 239-105.000.
Johnston, Malcolm. Standing support for handicapped persons. 4,349,195, Cl. 272-134.000.
Johnston, Samuel J. B., to E M I Limited. Disc record preparation. 4,349,499, Cl. 264-107.000.
Jones, James H., to Merck & Co., Inc. Octahydrobenzo[6,7]cyclohept[1,2-b]-1,4-oxazines, compositions and use. 4,349,548, Cl. 424-248.400.
Jones, John F.: *See—*
Li, George S.; and Jones, John F., 4,349,652, Cl. 526-271.000.
Li, George S.; and Jones, John F., 4,349,653, Cl. 526-272.000.
Jones, Stanley; and Nyenbrink, Willard. Automatic door opening device. 4,348,835, Cl. 49-139.000.
Jones, Thaddeus M.: *See—*
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce R., 4,349,111, Cl. 209-534.000.
Jordan, Gerald J. Wheel assembly. 4,348,785, Cl. 16-046.000.
Jorgensen, Robert J.; Goeke, George L.; and Karol, Frederick J., to Union Carbide Corporation. Catalyst composition for copolymerizing ethylene. 4,349,648, Cl. 526-125.000.
Jost, Karel: *See—*
Cort, Joseph H.; Barth, Tomislav; Jost, Karel; and Veznik, Zdenek, 4,349,544, Cl. 424-177.000.
Jovanovic, Milenko: *See—*
Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, 4,349,718, Cl. 219-78.010.
Juillot, Guy: *See—*
Gaget, Alain; and Juillot, Guy, 4,349,489, Cl. 261-41.00D.
Jukes, Christopher E., to Mod-Lok Industries Ltd. Spacer extender. 4,348,847, Cl. 52-426.000.
Jung, Eggert, to Dr. Ing. Rudolf Hell GmbH. Method for the color evaluation of pattern models of fabric, decoration or packaging printing, and a color evaluation device. 4,349,279, Cl. 356-402.000.
Jurcak, Frank C. Oyster opener. 4,348,788, Cl. 17-76.000.
Juris, Mitchell A.; and Tomsa, Vladimir, to Bunker Ramo Corporation. Electrical connector assembly having enhanced EMI shielding. 4,349,241, Cl. 339-143.00R.
Jyojiki, Masao; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,349,254, Cl. 354-25.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Hoshi, Hideo; Mitsugi, Shiro; Teruyama, Hiroichi; and Tabata, Hideo, 4,349,763, Cl. 310-370.000.
Kaneko, Noboru; and Tabata, Junichi, 4,349,818, Cl. 340-785.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Akagi, Jiro, 4,349,152, Cl. 239-96.000.
Ichimura, Masaaki; Tarumizu, Yasumasa; and Uranaka, Kiyouzi, 4,348,864, Cl. 60-454.000.
Kabushiki Kaisha Kurio-Medikaru: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,348,873, Cl. 62-514.00R.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Komatsu, Fumito; and Shinozaki, Junichiro, 4,349,899, Cl. 368-75.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Aizawa, Hitomi, 4,349,900, Cl. 368-187.000.
Kabushiki Kaishi Kawai Gakki Seisakusho: *See—*
Sakashita, Noriji; Kugisawa, Toshio; Watanabe, Hironori; and Kitagawa, Hiroshi, 4,348,928, Cl. 84-1.010.
Kaeding, Warren W.: *See—*
Chu, Chin-Chiun; and Kaeding, Warren W., 4,349,461, Cl. 252-455.00Z.
Kagayama, Masao, to Unitika Ltd. Process for producing heat-resistant acetate kinase. 4,349,631, Cl. 435-194.000.
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., to TRW Inc. Shallow bulk acoustic wave devices. 4,349,794, Cl. 333-141.000.
Kah, Carl L. C., Jr. Magnetically actuated pilot valve. 4,349,045, Cl. 137-625.500.
Kaiser Aluminum & Chemical Corporation: *See—*
Goodnow, Warren H.; and Payne, John R., 4,349,427, Cl. 204-243.00R.
Kaki, Haruhiko: *See—*
Ogawa, Hiroyuki; and Kaki, Haruhiko, 4,349,304, Cl. 414-106.000.
Kakitani, Yohtaro: *See—*
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.
Kaman, Charles H.; and Mayerjak, Robert J., to Currier Piano Company, Inc. Soundboard assembly for pianos or the like. 4,348,933, Cl. 84-193.000.
Kameyama, Masao; and Shiomi, Teiichi, to Mitsui Petrochemical Industries, Ltd. Laminated multilayer structure. 4,349,603, Cl. 428-334.000.
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Photoresist composition. 4,349,619, Cl. 430-196.000.
Kanamori, Hiroshi, to Nissan Motor Co., Ltd. Yieldable type ornament assembly. 4,349,591, Cl. 428-31.000.
Kanebo Foods, Ltd.: *See—*
Hayashi, Masaho, 4,349,110, Cl. 206-606.000.
Kaneko, Noboru; and Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Electrochromic display device. 4,349,818, Cl. 340-785.000.
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, to Ricoh Co., Ltd. Sheet classifying system having deflecting device. 4,349,190, Cl. 271-297.000.
Kango Electric Hammers Limited: *See—*
Ince, Norman J., 4,349,074, Cl. 173-48.000.
Kanno, Yoshinori: *See—*
Ohmae, Tadayuki; Murakami, Teruhiko; and Kanno, Yoshinori, 4,349,654, Cl. 526-273.000.
Kanzaki Paper Manufacturing Company Limited: *See—*
Iwasaki, Hiroshi; Irii, Shinsuke; and Kondo, Mitsuru, 4,349,454, Cl. 252-312.000.
Karl Mayer Textilmaschinen fabrik GmbH: *See—*
Roth, Josef, 4,348,876, Cl. 66-84.00A.
Karol, Frederick J.: *See—*
Jorgensen, Robert J.; Goeke, George L.; and Karol, Frederick J., 4,349,648, Cl. 526-125.000.
Karpodines, Marco. Controlled ambience speaker system. 4,349,084, Cl. 181-146.000.
Kashio, Toshio, to Casio Computer Co., Ltd. Musical instrument type-selecting system for an electronic musical instrument. 4,348,932, Cl. 84-1.190.
Kashiwakura, Toshimi: *See—*
Takeda, Keiso; Inouye, Shozo; and Kashiwakura, Toshimi, 4,348,997, Cl. 123-445.000.
Kasuga, Noboru; Hara, Kazumasa; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Sewing machine with a horizontal-type loop taker. 4,348,969, Cl. 112-184.000.
Kasugai, Akiyo: *See—*
Nagashima, Teruyoshi; Takami, Akio; and Kasugai, Akiyo, 4,349,585, Cl. 427-125.000.
Kato, Yasuyuki; Sugimoto, Hiroaki; and Hanabata, Makoto, to Sumitomo Chemical Company, Limited. Process for producing aromatic polyester. 4,349,659, Cl. 528-193.000.
Kaump, Roland F. Grate and water recovery system. 4,349,436, Cl. 210-104.000.
Kawaguchi, Tsutomu: *See—*
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.
Kawai, Tsutomu, to Funai Electric Co., Ltd.; and Efuti Giken Co. Sound-dubbing mechanism for a video tape recorder. 4,349,852, Cl. 360-137.000.
Kawakami, Takashi: *See—*
Onishi, Masayoshi; Nobuto, Shinichi; Kawakami, Takashi; and Yamamoto, Shigemi, 4,349,007, Cl. 123-617.000.
Kawamoto, Michio: *See—*
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,005, Cl. 123-571.000.
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,349,006, Cl. 123-571.000.
Kawamoto, Tamio, to Nissan Motor Co., Ltd. Mounting structure for a lubricating oil channel of an extension bushing. 4,348,914, Cl. 74-467.000.
Kawamura, Koji: *See—*
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo; and Tamba, Shinichi, 4,348,862, Cl. 60-314.000.
Kawashiri, Kazuhiro; Mizobuchi, Yuzo; Higashi, Akio; Tamura, Hiroshi; Takeda, Keiji; and Nagata, Masayoshi, to Fuji Photo Film Co., Ltd. Function separated type electrophotographic light-sensitive members and process for production thereof. 4,349,617, Cl. 430-59.000.
Kearns, Edward C.: *See—*
Kearns, Richard F.; Kearns, Thomas R.; and Kearns, Timothy P., 4,349,398, Cl. 156-71.000.
Kearns, Richard F.; Kearns, Thomas R.; and Kearns, Timothy P., to Kearns, Edward C. Protective coating system. 4,349,398, Cl. 156-71.000.
Kearns, Thomas R.: *See—*
Kearns, Richard F.; Kearns, Thomas R.; and Kearns, Timothy P., 4,349,398, Cl. 156-71.000.
Kearns, Timothy P.: *See—*
Kearns, Richard F.; Kearns, Thomas R.; and Kearns, Timothy P., 4,349,398, Cl. 156-71.000.
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., to Monsanto Company. Inhibition of polyurethane hardening. 4,349,640, Cl. 524-294.000.

Keh-Yeu, Chiang: *See*—
Yang, Yih-Chen, 4,349,123, Cl. 220-407.000.
Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Deformable vacuum mold for shaping glass sheets. 4,349,375, Cl. 65-291.000.
Kelley, Jay H. Systemic roof support. 4,349,300, Cl. 405-288.000.
Kelly, Darrell A.: *See*—
Blackmon, Lawrence E.; Dees, John R.; Kelly, Darrell A.; Mowe, Wayne T.; and Yu, Jing-peir, 4,349,604, Cl. 428-370.000.
Kelvinator Commercial Products, Inc.: *See*—
Swanson, Richard H., 4,348,965, Cl. 108-152.000.
Kemira Oy: *See*—
Toivonnen, Hannu J., 4,349,660, Cl. 528-261.000.
Kemppi Oy: *See*—
Makimaa, Toivo T., 4,349,720, Cl. 219-130.330.
Kendall Company, The: *See*—
Perlin, Alfred R., 4,349,031, Cl. 128-642.000.
Kennecott Corporation: *See*—
Cichy, Paul, 4,349,381, Cl. 75-10.00R.
Cichy, Paul, 4,349,909, Cl. 373-84.000.
Miedaner, Patrick M.; and Kucheria, Chhattar S., 4,349,637, Cl. 501-126.000.
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,349,145, Cl. 228-208.000.
Kermath Manufacturing Corporation: *See*—
Moore, Robert M., 4,349,917, Cl. 378-24.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Kluth, Manfred; Antoni, Heinz; and Stich, Werner, 4,348,909, Cl. 73-863.210.
Ketterer, Dieter; Jakubaschk, Horst; and Rommel, Emil, to Heckler & Koch GmbH. Shoulder arm with swivel breech member. 4,348,941, Cl. 89-155.000.
KEWA Kernbrennstoff-Wiederaufarbeitungs-Gesellschaft mbH: *See*—
Krug, Gunter; Lahr, Helfried; Schween, Peter; and Wieczorek, Herbert, 4,349,465, Cl. 252-626.000.
Khattab, Ghazi M. A., to Allied Corporation. Preparation of metal plated polyamide thermoplastic articles having mirror-like metal finish. 4,349,421, Cl. 204-38.00B.
Kia, James D.: *See*—
Glassman, Stephen M.; Kia, James D.; and Ryding, Paul A., 4,349,016, Cl. 128-87.00R.
Kienzle Apparate GmbH: *See*—
Blaser, Paul; Schmidt, Helmut; and Strobel, Walter, 4,349,286, Cl. 400-492.000.
Kikuchi, Hideo: *See*—
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.
Kikuchi, Hiroshi: *See*—
Oda, Takeshi; and Kikuchi, Hiroshi, 4,348,810, Cl. 30-210.000.
Kikuchi, Michitsugu; and Suzuki, Yoshio, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,349,063, Cl. 152-359.000.
Kim, Sung C.; and Schwartz, Marvin P., to International Telephone and Telegraph Corporation. Double-walled finned heat transfer tube. 4,348,794, Cl. 29-157.3AH.
Kimberly-Clark Corporation: *See*—
Singer, Wayne J., 4,349,019, Cl. 128-132.00D.
Kinaga, Eiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,349,226, Cl. 297-475.000.
Kindler, Horst: *See*—
Tappe, Horst; Kindler, Horst; Roth, Kurt; and Weyer, Hans-Jurgen, 4,349,348, Cl. 8-464.000.
King, Dennis E.: *See*—
Bain, Kenneth J. D.; King, Dennis E.; Worship, Lesley A.; and Burton, Achmat T., 4,349,117, Cl. 220-4.00F.
Kings Electronics Co., Inc.: *See*—
Scheiner, Harry, 4,349,792, Cl. 333-81.00A.
Kins Developments Limited: *See*—
English, Martin; Pym, David P.; and Dawson, Lindsay G., 4,349,628, Cl. 435-161.000.
Kirby, Roy J., to Superflexit Limited. End fitting assembly for a conduit. 4,349,221, Cl. 285-149.000.
Kirchner, Helmut: *See*—
Lorenz, Hans-Walther; Schumacher, Gerd; and Kirchner, Helmut, 4,348,887, Cl. 73-23.000.
Kishimoto, Yoshio; and Shimotsuma, Wataru, to Matsushita Electric Industrial Company, Limited. Conductive device using conductive polymer compositions. 4,349,606, Cl. 428-411.000.
Kitagawa, Hiroshi: *See*—
Sakashita, Norij; Kugisawa, Toshio; Watanabe, Hironori; and Kitagawa, Hiroshi, 4,348,928, Cl. 84-1.010.
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, to Seiko Koki Kabushiki Kaisha. Manual focal point adjusting and change-over device for use in automatic focal point adjuster camera. 4,349,258, Cl. 354-127.000.
Kitamura, Tomosaburo; Miyahara, Kosuke; and Kodera, Yoichi, to Sony Corporation. Fiber reinforced piezoelectric bender transducer. 4,349,762, Cl. 310-332.000.
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Company, Ltd. Peptide, process for preparation thereof and use thereof. 4,349,466, Cl. 260-112.50R.
Kitawaki, Kazuya: *See*—
Yaji, Saichi; Kitawaki, Kazuya; and Furuya, Takafumi, 4,349,052, Cl. 139-92.000.
Kittle, Carl E.: *See*—
Gardner, Frank H.; and Kittle, Carl E., 4,348,917, Cl. 74-568.00R.
Klahr, Erhard; Trieselt, Wolfgang; Trapp, Horst; and Widder, Rudi, to BASF Aktiengesellschaft. Purification of alkylglycosides by distillative removal of unconverted alcohols. 4,349,669, Cl. 536-127.000.
Klar, Heiner: *See*—
Pfleiderer, Hans-Joerg; and Klar, Heiner, 4,349,749, Cl. 307-221.00D.
Klar, Rudolf; and Beier, Ulrich, to Continental Gummi-Werke Aktiengesellschaft. Sealing element. 4,349,122, Cl. 220-373.000.
Klein, Morris M.: *See*—
Brixner, Berlyn B.; Klein, Morris M.; and Winkler, Max A., 4,349,249, Cl. 350-483.000.
Klem, John E., to International Harvester Co. Hydraulic valve block mounting. 4,349,046, Cl. 137-899.000.
Klem, John E., to International Harvester Co. Structure for center hinge and boom cylinder pivot. 4,349,307, Cl. 414-686.000.
Kliman, Arthur W., to Baird Corporation. Modular natural lighting system. 4,349,245, Cl. 350-264.000.
Klockner-Humboldt-Deutz AG: *See*—
Abelitis, Andris, 4,349,387, Cl. 106-100.000.
Chaudhuri, Kiranendu B., 4,349,383, Cl. 75-73.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Brockmann, Heinz, 4,349,080, Cl. 180-301.000.
Nolte, Albert; Schleiermacher, Herbert; and Arbeiter, Erich, 4,348,990, Cl. 123-41.120.
Kluge, Arthur F.: *See*—
Roszkowski, Adolph P.; Clark, Robin D.; and Kluge, Arthur F., 4,349,549, Cl. 424-248.550.
Klumpp, Walter: *See*—
Bremer, Clemens; and Klumpp, Walter, 4,348,940, Cl. 89-140.000.
Kluth, Manfred; Antoni, Heinz; and Stich, Werner, to Kernforschungszentrum Karlsruhe GmbH. Sampling probe for taking partial liquid quantities from various phases of two immiscible liquids. 4,348,909, Cl. 73-863.210.
Knapp, Evalyn L.: *See*—
Collins, Darryl L.; Collins, Donna L.; Knapp, Merton C.; and Knapp, Evalyn L., 4,349,225, Cl. 294-16.000.
Knapp, Frank H.; and Spector, George. Snow life shoes. 4,348,823, Cl. 36-123.000.
Knapp, Merton C.: *See*—
Collins, Darryl L.; Collins, Donna L.; Knapp, Merton C.; and Knapp, Evalyn L., 4,349,225, Cl. 294-16.000.
Knierim, Donald V. Security device. 4,348,879, Cl. 70-93.000.
Knight, Lindsay C., to Australasian Training Aids, Pty., Ltd. Discriminatory hit detection in target apparatus. 4,349,729, Cl. 235-400.000.
Knoth, Werner-Dieter: *See*—
Hullen, Helmut; and Knoth, Werner-Dieter, 4,349,368, Cl. 65-28.000.
Knotik, Karl; Leichter, Peter; and Glock, Johann, to Osterreichische Studiengesellschaft fur Atomenergie Ges.m.b.H. Method of concentrating and drying water-containing fluent media. 4,349,412, Cl. 159-47.0WL.
Kobayashi, Kazufumi; and Hashimoto, Shigeru, to Canon Kabushiki Kaisha. Support structure for the aperture signal transmitting means in a camera lens assembly. 4,349,265, Cl. 354-286.000.
Kobayashi, Keizou: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,348,873, Cl. 62-514.00R.
Kobayashi, Koichi: *See*—
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, 4,349,409, Cl. 156-643.000.
Kobayashi, Masaru: *See*—
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.
Kobayashi, Toru: *See*—
Ueno, Kazunori; and Kobayashi, Toru, 4,348,841, Cl. 52-126.500.
Kobishi Electric Co., Ltd.: *See*—
Shimoya, Shigeo, 4,349,800, Cl. 335-207.000.
Kock, Hendrikus G.: *See*—
Deunhouwer, Anthony H.; and Kock, Hendrikus G., 4,348,795, Cl. 29-411.000.
Kodera, Yoichi: *See*—
Kitamura, Tomosaburo; Miyahara, Kosuke; and Kodera, Yoichi, 4,349,762, Cl. 310-332.000.
Koehring GmbH-BOMAG Division: *See*—
Vural, Gulertan; and Blancke, Uwe, 4,348,901, Cl. 73-594.000.
Kohler, Hans-Dieter: *See*—
Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, 4,349,416, Cl. 203-19.000.
Kohsaka, Masanobu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Koike, Mikio: *See*—
Kasuga, Noboru; Hara, Kazumasa; and Koike, Mikio, 4,348,969, Cl. 112-184.000.
Koitabashi, Takeo; Matsuzaka, Syozi; and Iijima, Tashifumi, to Konishiroku Photo Industry Co., Ltd. Photographic silver halide emulsion

comprising epitaxial composite silver halide crystals, silver iodobromide emulsion and process for preparing the same. 4,349,622, Cl. 430-567.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Amano, Kitsutaro; Nakai, Taiichiro; Sato, Masanori; and Nunokawa, Makoto, 4,349,243, Cl. 350-96.230.

Kolehmainen, Seppo; and Tarkkanen, Veikko. Method and apparatus for measurement of samples by luminescence. 4,349,510, Cl. 422-66.000.

Kolyada, Vladimir A.: *See*—
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; and Mataev, Arkady R., 4,349,431, Cl. 204-302.000.
Efimov, Vyacheslav T.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; Shamsha, Ljudmila F.; and Axenko, Alexandr A., 4,349,430, Cl. 204-302.000.

Komatsu, Fumito; and Shinozaki, Junichiro, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box having time-sounding function. 4,349,899, Cl. 368-75.000.

Kondo, Mitsuru: *See*—
Iwasaki, Hiroshi; Irii, Shinsuke; and Kondo, Mitsuru, 4,349,454, Cl. 252-312.000.

Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive compositions and electrophotographic light-sensitive materials using said compositions. 4,349,618, Cl. 430-83.000.

Kondo, Tsutomu: *See*—
Koyama, Yukio; Kondo, Tsutomu; Matsuzaki, Mikio; and Akizuki, Kunio, 4,349,247, Cl. 350-302.000.

Kondo, Yoshinobu: *See*—
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,349,215, Cl. 280-804.000.

Kondo, Yukio: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Goto, Mikio; and Kondo, Yukio, 4,349,509, Cl. 422-57.000.

Konersmann, Erhard, to Werkzeugmaschinenfabrik Oerlikon-Buhrle. Method for producing surfaces at a blade cutter head formed of hardened cutter blade steel. 4,348,839, Cl. 51-281.00R.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hirata, Masao, 4,349,268, Cl. 355-4.000.
Koitabashi, Takeo; Matsuzaka, Syozi; and Iijima, Tashifumi, 4,349,622, Cl. 430-567.000.

Koprowski, Hilary; Mitchell, Kenneth F.; and Steplewski, Zenon, to Wistar Institute, The. Monocolonal hybridoma antibody specific for high molecular weight carcinoembryonic antigen. 4,349,528, Cl. 424-1.000.

Koseki, Teruo: *See*—
Hiramatsu, Toru; Koseki, Teruo; Hamada, Satosi; and Sumida, Atsushi, 4,349,523, Cl. 423-447.400.

Kostelc, James G.: *See*—
Labows, John N.; Kostelc, James G.; and McGinley, Kenneth J., 4,349,626, Cl. 435-38.000.

Kosugi, Makoto: *See*—
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, 4,349,409, Cl. 156-643.000.

Kouno, Akiyoshi; Morishita, Masanobu; and Yui, Yoshio, to Nippon Electric Co., Ltd. Circuit for making a CRT display a TV picture for a copy with dots superposed on half-tone picture areas. 4,349,844, Cl. 358-244.000.

Koval, Stephen F.: *See*—
Eny, Nicholas R., 4,349,299, Cl. 405-261.000.

Koyama, Yukio; Kondo, Tsutomu; Matsuzaki, Mikio; and Akizuki, Kunio, to Mitsubishi Motors Corp.; and Ichikoh Industries Ltd. Mirror apparatus for automobile. 4,349,247, Cl. 350-302.000.

Koyata, Kenzi, to Olympus Optical Co., Ltd. Endoscope with an ultrasonic probe. 4,349,032, Cl. 128-660.000.

Kral, Jaroslav J.: *See*—
Zuber, Bretislav; and Kral, Jaroslav J., 4,349,780, Cl. 324-262.000.

Kramer, Wolfgang: *See*—
Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, 4,349,556, Cl. 424-269.000.

Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Bolometer. 4,349,808, Cl. 338-18.000.

Krauss-Kalweit, Irene. Method and device for determining the transmissibility of a fluid-conducting borehole layer. 4,348,897, Cl. 73-155.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Polyfluoroallyloxy compounds, their preparation and copolymers therefrom. 4,349,650, Cl. 526-243.000.

Krevitz, Kenneth: *See*—
Pytlewski, Louis L.; and Krevitz, Kenneth, 4,349,380, Cl. 75-0.50A.

KRG, Inc.: *See*—
Glassman, Stephen M.; Kia, James D.; and Ryding, Paul A., 4,349,016, Cl. 128-87.00R.

Krieg, Michael L.: *See*—
Flurry, Gregory A.; Krieg, Michael L.; and Phillips, David W., 4,349,742, Cl. 250-568.000.

Krier, Martin: *See*—
Liebel, Henry L.; and Krier, Martin, 4,349,303, Cl. 410-154.000.

Krikorian, William G. Shirred laminate. 4,349,020, Cl. 128-155.000.

Kristiansen, Odd: *See*—
Ackermann, Peter; Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Wehrli, Rudolf, 4,349,567, Cl. 424-305.000.

Krug, Gunter; Lahr, Helfried; Schween, Peter; and Wieczorek, Herbert, to KEWA Kernbrennstoff-Wiederaufarbeitungs-Gesellschaft mbH. Process for the treatment of combustible, solid radioactive wastes. 4,349,465, Cl. 252-626.000.

Krugener, Rolf: *See*—
Kurth, Hermann W.; and Krugener, Rolf, 4,349,722, Cl. 219-202.000.

Krulick, Steven E.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., 4,349,070, Cl. 165-173.000.

Krumwiede, John F., to PPG Industries, Inc. Method of recovering waste heat from furnace flue gases using a granular heat exchange means. 4,349,367, Cl. 65-27.000.

Kruse, William E. Wedge-forming pile. 4,349,298, Cl. 405-256.000.

Kubat, Josef; Rigdahl, Hans M.; and Djurner, Jan K. Injection moulding process using polymer blends containing high molecular polyethylene of high density. 4,349,504, Cl. 264-328.170.

Kubicek, Frantisek: *See*—
Raboud, Pierre-Benoit; Kubicek, Frantisek; and Bandi, Jean-Pierre, 4,349,579, Cl. 426-631.000.

Kubler, Ulrich, to Licentia Patent-Verwaltungs-G.m.b.H. Switching of channels between two premodulation systems. 4,349,903, Cl. 370-57.000.

Kubo, Masaharu: *See*—
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.

Kubo, Seitoku: *See*—
Ito, Takayoshi; Kubo, Seitoku; and Terakura, Yukio, 4,349,088, Cl. 192-3.300.

Kubota, Jun: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.

Kucheria, Chhattar S.: *See*—
Miedaner, Patrick M.; and Kucheria, Chhattar S., 4,349,637, Cl. 501-126.000.

Kuffer, Hans, to Rheinmetall GmbH. Ignition arrangement for ammunition in a barrel weapon. 4,348,937, Cl. 89-24.000.

Kufrin, Robert: *See*—
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,349,662, Cl. 528-301.000.

Kugisawa, Toshio: *See*—
Sakashita, Noriji; Kugisawa, Toshio; Watanabe, Hironori; and Kitagawa, Hiroshi, 4,348,928, Cl. 84-1.010.

Kugo, Masaru; and Igarashi, Osamu, to Hitachi, Ltd. Signal lamp apparatus with a lamp burnout detecting circuit. 4,349,810, Cl. 340-79.000.

Kuhfus, Gerd, to Northern Telecom Limited. Lighted telephone dial. 4,349,705, Cl. 179-90.00L.

Kuhl, Rudolf: *See*—
Nutzel, Hans G.; and Kuhl, Rudolf, 4,349,423, Cl. 204-146.000.

Kuijk, Karel E.: *See*—
Wiegman, Nelie J.; and Kuijk, Karel E., 4,349,893, Cl. 365-20.000.

Kulynych, Larysa H.; Romankiw, Lubomyr T.; and von Gutfeld, Robert J., to International Business Machines Corporation. Laser enhanced maskless method for plating and simultaneous plating and etching of patterns. 4,349,583, Cl. 427-53.100.

Kunkel, Wolfgang: *See*—
Goor, Gustaaf; and Kunkel, Wolfgang, 4,349,526, Cl. 423-588.000.

Kunz, Walter: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,349,550, Cl. 424-250.000.

Kuo, Wey-Chaung: *See*—
Micheli, Adolph L.; and Kuo, Wey-Chaung, 4,349,709, Cl. 200-19.00R.

Kuramoto, Kikuzo; and Enoki, Takahiro, to Nisso Industries Co. Ltd. Locking device. 4,348,790, Cl. 24-211.00P.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Noguchi, Tatsuhiko; Kurita, Ryuichi; Nemoto, Ken; and Endo, Kiichi, 4,349,447, Cl. 252-117.000.

Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electromagnetic release device for single lens reflex camera. 4,349,261, Cl. 354-152.000.

Kurihara, Kazuhiko: *See*—
Yazawa, Masahide; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,349,500, Cl. 264-159.000.

Kurihara, Takenori, to Takeda Riken Kogyo Kabushikikaisha. Stabilized sweep frequency generator with adjustable start and stop frequencies. 4,349,789, Cl. 331-4.000.

Kurita, Ryuichi: *See*—
Noguchi, Tatsuhiko; Kurita, Ryuichi; Nemoto, Ken; and Endo, Kiichi, 4,349,447, Cl. 252-117.000.

Kuroda, Toshio: *See*—
Yamada, Masahide; Edanami, Kenichi; and Kuroda, Toshio, 4,349,546, Cl. 424-180.000.

Kuroda, Yasuo: *See*—
Ishiwata, Shoji; Kuroda, Yasuo; Tanaka, Shoichi; Watanabe, Tsuneo; and Hasegawa, Shinichi, 4,349,513, Cl. 423-12.000.

Kuroda, Yoshio: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.

Kuroiwa, Hiroshi: *See*—
Oyama, Yoshishige; and Kuroiwa, Hiroshi, 4,349,877, Cl. 364-431.050.

Kurth, Hermann W.; and Krugener, Rolf, to Daimler-Benz Aktiengesellschaft. Moisture protection and drainage arrangement for motor vehicle closure locks. 4,349,722, Cl. 219-202.000.

Kwok, Sai W., to GTE Automatic Electric Laboratories, Inc. RF Trap for a cable television trunk amplifier station. 4,349,795, Cl. 333-176.000.

Kwon, Yiduk; and Lawson, Paul, to Exxon Research & Engineering Co. Temperature compensated voltage regulator for photovoltaic charging systems. 4,349,775, Cl. 320-35.000.

Kyburz, Emilio; and Aschwanden, Werner, to Hoffmann-La Roche Inc. Substituted 2-pyrrolidinones. 4,349,562, Cl. 424-274.000.

L. Schuler GmbH: *See*—
Schneider, Franz; Schumann, Burkhard; Maier, Karl; and Hohn, Herbert, 4,349,310, Cl. 414-749.000.

Laakmann, Katherine D.; and Laakmann, Peter, to Flir Systems, Inc. Television compatible thermal imaging system. 4,349,843, Cl. 358-206.000.

Laakmann, Peter: *See*—
Laakmann, Katherine D.; and Laakmann, Peter, 4,349,843, Cl. 358-206.000.

Labows, John N.; Kostelc, James G.; and McGinley, Kenneth J., to Monell Chemical Senses Center, The. Method of detecting *Pseudomonas aeruginosa* infections utilizing selected ketone and/or sulfur metabolites. 4,349,626, Cl. 435-38.000.

Lafferty, James, to Rehrig Pacific Corporation. Case with hinged lid assembly. 4,349,121, Cl. 220-341.000.

Lahr, Helfried: *See*—
Krug, Gunter; Lahr, Helfried; Schween, Peter; and Wieczorek, Herbert, 4,349,465, Cl. 252-626.000.

Laimer, Friedrich: *See*—
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Lake, Jack E., to Racine Federated, Inc. Fluid flow device. 4,349,711, Cl. 200-153.0LA.

Lalak, Joseph: *See*—
Stupp, Edward H.; and Lalak, Joseph, 4,349,410, Cl. 156-654.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Abdominal sidebend machine-upper. 4,349,191, Cl. 272-118.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Counterbalanced weight system. 4,349,192, Cl. 272-118.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Lower abdominal twist machine. 4,349,193, Cl. 272-118.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Apparatus for exercising the inner and outer thigh muscles. 4,349,194, Cl. 272-118.000.

Lambert, Lloyd J., Sr.: *See*—
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 4,349,191, Cl. 272-118.000.
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 4,349,192, Cl. 272-118.000.
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Lambert, Michael B.: *See*—
Taylor, Heyward T.; and Lambert, Michael B., 4,348,863, Cl. 60-327.000.

Lampson, Neil F., to Riggers Manufacturing Co. Crane. 4,349,115, Cl. 212-178.000.

Landron, Rafael: *See*—
Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,349,635, Cl. 501-15.000.

Landry, Norman R., to RCA Corporation. Coax to rectangular waveguide coupler. 4,349,790, Cl. 333-24.100.

Langeman, Peter J. Irrigation ditch gate. 4,349,296, Cl. 405-99.000.

Langenfeld, Norbert: *See*—
Blank, Heinz U.; Wolters, Erich; and Langenfeld, Norbert, 4,349,471, Cl. 260-208.000.

Langford, William D., to Occidental Oil Shale. Mining system for in situ oil shale retorts. 4,349,227, Cl. 299-2.000.

Lansing Bagnall Limited: *See*—
Gibbons, Ralph D., 4,348,805, Cl. 29-857.000.

LaPaglia, Angelo F. Cottage cheese processor. 4,348,951, Cl. 100-127.000.

Laperle, Raymond A.: *See*—
Robson, William F.; and Laperle, Raymond A., 4,349,783, Cl. 324-457.000.

Larson, Roger R.; and Hatfield, Efton E. Process of recycling animal waste. 4,349,572, Cl. 426-335.000.

Lary, Richard F., to Digital Equipment Corporation. Duplicate tag store for cached multiprocessor system. 4,349,871, Cl. 364-200.000.

LaSalle Machine Tool, Inc.: *See*—
Wiknich, Douglas D.; and Peabody, Michael J., 4,349,099, Cl. 198-751.000.

Lau, Kei F.: *See*—
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., 4,349,794, Cl. 333-141.000.

Laupman, Robert R., to Novanex Automation N.V. Compressor. 4,349,787, Cl. 330-284.000.

Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, to A. Nattermann & Cie GmbH. N-Substituted ω-(2-oxo-4-imidazolin-1-yl) alcanoic acids and salts and esters thereof. 4,349,684, Cl. 548-320.000.

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Lawson, John D., to Cyclone International, Inc. Poultry feeder with infinite adjustment. 4,348,988, Cl. 119-53.000.

Lawson, Paul: *See*—
Kwon, Yiduk; and Lawson, Paul, 4,349,775, Cl. 320-35.000.

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Eves, William J.; and Lazaro, Luis J., Jr., 4,348,806, Cl. 29-863.000.

Leaverton, James A.: *See*—
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., 4,349,794, Cl. 333-141.000.

Lebeault, Jean-Michel: *See*—
Segard, Emile-Pierre; and Lebeault, Jean-Michel, 4,349,570, Cl. 426-52.000.

Leber, Edmond, to Sevylor. Inflatable boat with additional inflatable elements compensating for loss in buoyancy. 4,348,779, Cl. 114-345.000.

Lebrun, Jean-Paul R.: *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,348,980, Cl. 118-717.000.

Lectromelt Corporation: *See*—
Bello, James R., 4,349,912, Cl. 373-105.000.

Lee, Bong K.; Marquez, Joseph A.; and Waitz, J. Allan, to Schering Corporation. Macrolide antibiotic complex. 4,349,665, Cl. 536-7.100.

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Eldred, John W.; Legg, James B.; and Earley, James A., 4,349,101, Cl. 198-851.000.

Lehnhardt, William F.; Streaty, Charles E., Jr.; Yackel, Walter C., Jr.; Yang, Ho S.; and Tang, Daniel K., to A. E. Staley Manufacturing Company. Soy isolate in meltable imitation cheese. 4,349,576, Cl. 426-582.000.

Leiber, Heinz, to Robert Bosch GmbH. Power steering for motor vehicles. 4,349,079, Cl. 180-143.000.

Leichter, Peter: *See*—
Knotik, Karl; Leichter, Peter; and Glock, Johann, 4,349,412, Cl. 159-47.0WL.

Leitermann, Wulf; and Pflugfelder, Karl, to Audi NsU Auto Union Aktiengesellschaft. Switching apparatus for the mechanical remote control of the gear box of a motor vehicle. 4,348,915, Cl. 74-473.00R.

Leitner, Wolfgang; Pampouchidis, Georg; and Bleikolm, Anton, to Vianova Kunstharz, A.G. Water-dilutable binders carrying oxazolidine groups. 4,349,655, Cl. 528-45.000.

Lemay, Richard A.: *See*—
Woods, William E.; Stanley, Philip E.; Cushing, David E.; and Lemay, Richard A., 4,349,874, Cl. 364-200.000.

Lemoussu, Michel; and Cardot, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Phase-controlling feedback circuit for single sideband demodulation. 4,349,785, Cl. 329-50.000.

Leonard, Ronald W.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., 4,349,070, Cl. 165-173.000.

Leong, Basil K. J., to Upjohn Company, The. Animal inhalation exposure system. 4,348,985, Cl. 119-15.000.

Leorat, Francois J., to Regie Nationale des Usines Renault. Piston compressor derived from a reciprocating thermal engine. 4,349,320, Cl. 417-237.000.

Lerner, Michael. Cleat. 4,348,974, Cl. 114-218.000.

Les Cables de Lyon: *See*—
Vives, Jean-Patrick, 4,349,694, Cl. 174-128.00R.

Les Fabriques d'Assortiments Reunies: *See*—
Berney, Jean, 4,348,813, Cl. 33-172.00R.

Lesavage, Stephen J. Snowshoe footwear. 4,348,822, Cl. 36-122.000.

Leslie Hartridge Limited: *See*—
Emerson, Reginald S.; and Lovelock, John E., 4,348,894, Cl. 73-119.00A.

Letica Corporation: *See*—
Letica, Ilija, 4,349,119, Cl. 220-306.000.

Letica, Ilija, to Letica Corporation. Container construction. 4,349,119, Cl. 220-306.000.

Levinson, Lionel M., to General Electric Company. Method for fabricating free-standing thick-film varistors. 4,349,496, Cl. 264-61.000.

Levy, Hilton B., to United States of America, Health and Human Services. Nuclease-resistant hydrophilic complex of polyriboinosinic-polyribocytidylic acid. 4,349,538, Cl. 424-85.000.

Lewis, Christopher M., to P A Management Consultants Limited. Coin discriminating apparatus. 4,349,095, Cl. 194-100.00A.

Li, George S.; and Jones, John F., to Sohio. High nitrile resins containing maleic anhydride. 4,349,652, Cl. 526-271.000.

Li, George S.; and Jones, John F., to Standard Oil Company, The. High nitrile resins containing maleic anhydride. 4,349,653, Cl. 526-272.000.

Li, Tsi T.: *See*—
Arendt, Volker D.; and Li, Tsi T., 4,349,656, Cl. 528-63.000.

Libertini, Zoltan L.; and Ivanko, Theodore, to Avco Corporation. Boltless blade retainer for a turbine wheel. 4,349,318, Cl. 416-220.00R.

Liberto, Samuel J.; and Meli, James. Emergency heating system control circuit. 4,349,148, Cl. 236-11.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Kubler, Ulrich, 4,349,903, Cl. 370-57.000.

Lichty, William R.: *See*—
Hoffman, William C.; Gunther, John E.; and Lichty, William R., 4,349,817, Cl. 340-784.000.

Liebel, Henry L.; and Krier, Martin, to Angleboard Inc. Load spacer. 4,349,303, Cl. 410-154.000.

Liede, Dieter, to Robert Bosch GmbH. Method for sterilizing containers. 4,349,508, Cl. 422-1.000.
Lienhard, Paul: *See*—
Iqbal, Abul; and Lienhard, Paul, 4,349,671, Cl. 542-417.000.
Liff, Lawrence J. Liquid base makeup composition. 4,349,535, Cl. 424-63.000.
Lilly, A. Clifton, Jr.: *See*—
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.
Lin, Chung-Yuan: *See*—
Barsa, Edward A.; Lin, Chung-Yuan; and Stuber, Fred A., 4,349,663, Cl. 528-367.000.
Lindemann, Klaus, to WABCO Fahrzeugbremsen GmbH. Control arrangement for improving the driving stability of motor vehicles which are equipped with anti-skid brake systems. 4,349,876, Cl. 364-426.000.
Lindmayer, Joseph, to Solarex Corporation. Method of making constant voltage solar cell and product formed thereby utilizing low-temperature aluminum diffusion. 4,349,691, Cl. 136-261.000.
Lindow, Edwin L.; and Richards, Bradley T., to Caterpillar Tractor Co. Flux dam assembly and method. 4,349,717, Cl. 219-73.200.
Lingappa, Banadakoppa T.; and Lingappa, Yamuna. Methane generator. 4,349,355, Cl. 48-111.000.
Lingappa, Yamuna: *See*—
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Lischewski, Manfred; Adam, Habil G.; and Serebryakov, Edward P., to Akademie der Wissenschaften der DDR. Tritiated gibberellin aldehydes. 4,349,481, Cl. 549-297.000.
Litton Industrial Products, Inc.: *See*—
Stevenson, Christopher T. S.; and D'Aloisio, Elio F., 4,349,144, Cl. 228-2.000.
Litton Systems Inc.: *See*—
Wirt, Thomas M.; and Chechile, Robert A., 4,349,183, Cl. 267-160.000.
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. Intermediate for synthesis of thienamycin via (3SR, 4RS)-3-[1 (SR)-hydroxyethyl]-2-oxo-4-azetidineacetic acid. 4,349,687, Cl. 549-291.000.
Livick, Lester R. Matching game. 4,349,197, Cl. 273-1.0GF.
Locher, Donald A.: *See*—
Byers, J. Otto, Jr.; and Locher, Donald A., 4,349,319, Cl. 417-222.000.
Lochhead, Donald L.: *See*—
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., 4,349,794, Cl. 333-141.000.
Lockheed Corporation: *See*—
Ferguson, Jesse T., Jr., 4,349,302, Cl. 410-69.000.
Lodige, Fritz: *See*—
Lodige, Wilhelm, 4,349,280, Cl. 366-183.000.
Lodige, Wilhelm, to Lodige, Fritz; and Lucke, Josef, part interest to each. Continuously operating mixer for loose or and flowable material. 4,349,280, Cl. 366-183.000.
Loepfe, Erich, to Gebrueder Loepfe AG. Device for monitoring yarn motion on a textile machine. 4,349,784, Cl. 328-138.000.
Long, Robert A.; and Fan, Albert K., to GTE Products Corporation. Method of making high purity calcium hydrogen phosphate dihydrate. 4,349,518, Cl. 423-308.000.
Longview Fibre Company: *See*—
Bradley, Michael F.; and Viecelli, Jack C., 4,349,105, Cl. 206-317.000.
Lorang, Lucien: *See*—
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; and Lorang, Lucien, 4,349,382, Cl. 75-60.000.
Lord Corporation: *See*—
Blenner, Donald R.; and Boenig, Herman V., 4,349,403, Cl. 156-272.600.
Lord, Tom J.; and Snyder, William V., to PPG Industries, Inc. Apparatus for installing rolls on a conveyor shaft. 4,348,799, Cl. 29-450.000.
Lorenz, Hans-Walther; Schumacher, Gerd; and Kirchner, Helmut, to B.A.T. Cigaretten-Fabriken GmbH. Apparatus for determining the effects of dilution and/or diffusion on the gaseous components of a gas flow. 4,348,887, Cl. 73-23.000.
Lours, Sylvie: *See*—
Fitoussi, Richard; Lours, Sylvie; and Musikas, Claude, 4,349,350, Cl. 23-230.00R.
Lovelock, John E.: *See*—
Emerson, Reginald S.; and Lovelock, John E., 4,348,894, Cl. 73-119.00A.
Lowry, Alan: *See*—
Lyman, George F.; and Lowry, Alan, 4,349,632, Cl. 435-284.000.
Lu, Wen-Tong P.; and Ammon, Robert L., to United States of America, Energy. Carbon cloth supported electrode. 4,349,428, Cl. 204-294.000.
Lubbers, Marius H., to Everts & Van der Weyden Exploitatiemaatschappij. Concrete sleeper with the fastening housing. 4,349,150, Cl. 238-265.000.
Lucanera, Constantino, to International Standard Electric Corporation. Simple horizontally polarized omnidirectional antenna. 4,349,826, Cl. 343-773.000.
Lucas Industries Limited: *See*—
Buxton, Keith, 4,349,771, Cl. 318-685.000.
Jefferson, John R.; and Brown, Alexander G. M., 4,348,995, Cl. 123-366.000.
Lucke, Josef: *See*—
Lodige, Wilhelm, 4,349,280, Cl. 366-183.000.
Luenser, Werner R., to Ethyl Products Company. Thermoplastic screw-threaded closure cap. 4,349,116, Cl. 215-330.000.
Luftek, Inc.: *See*—
Carty, John J., 4,348,947, Cl. 98-58.000.
Luk Lamellen und Kupplungsbau GmbH: *See*—
Geschka, Hugo W.; and Beitecke, Bernd, 4,348,877, Cl. 68-13.00R.
Lundberg, Lynn B., to United States of America, Energy. Method of forming single crystals of beta silicon carbide using liquid lithium as a solvent. 4,349,407, Cl. 156-624.000.
Lundin, Lars I. Apparatus for collecting oil or similar substances from the surface of water. 4,349,439, Cl. 210-242.300.
Lutz, Andre: *See*—
Gouin d'Ambrieres, Solange; Lutz, Andre; and Gasc, Jean-Claude, 4,349,545, Cl. 424-180.000.
Lyman, George F.; and Lowry, Alan, to Data Packaging Corporation. Tissue culture cluster dish. 4,349,632, Cl. 435-284.000.
Lynes, Inc.: *See*—
Malone, Billy C., 4,349,204, Cl. 277-34.000.
Lyon, LaVern D.: *See*—
November, Milton H.; Lyon, LaVern D.; and Ponzi, Joseph J., 4,349,881, Cl. 364-509.000.
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N. Method of producing cubic boron nitride. 4,349,517, Cl. 423-290.000.
Macaluso, Paul J.; and Genthe, James E., to Pitney Bowes, Inc. Developer dispensing apparatus. 4,349,132, Cl. 222-156.000.
MacMaster, George H.: *See*—
Nichols, Lawrence J.; and MacMaster, George H., 4,349,791, Cl. 333-27.000.
Maeda, Keisuke; Takechi, Keiji; and Oya, Tetsuro, to Minolta Camera KK. Lens cap for a camera. 4,349,266, Cl. 354-295.000.
Maeda, Koichi, to Tokico Ltd. Vehicle height detecting device. 4,349,735, Cl. 260-229.000.
Maier, Karl: *See*—
Schneider, Franz; Schumann, Burkhard; Maier, Karl; and Hohn, Herbert, 4,349,310, Cl. 414-749.000.
Mair, William J., to Plastic Recycling Limited. Apparatus for manufacturing plastic products. 4,349,325, Cl. 425-363.000.
Makara, Satoshi, to Murata Manufacturing Co., Ltd. Cathode-ray tube socket substrate. 4,349,235, Cl. 339-14.00T.
Makimaa, Toivo T., to Kemppi Oy. Coupling arrangement for a welding apparatus. 4,349,720, Cl. 219-130.330.
Malhotra, Sudarshan K., to Dow Chemical Company, The. 6-(Chloro or substituted phenoxy)-2-di-(substituted phenoxy) methyl pyridines. 4,349,680, Cl. 546-302.000.
Malmohus Invest AB: *See*—
Edstrom, Lars G., 4,349,189, Cl. 271-251.000.
Malone, Billy C., to Lynes, Inc. Non-extruding inflatable packer assembly. 4,349,204, Cl. 277-34.000.
Maloney, Daniel E., to Du Pont de Nemours, E. I., and Company. Electrolysis process. 4,349,422, Cl. 204-98.000.
Malotky, Lyle O.: *See*—
Mueller, Kurt F.; Chang, Marguerite S.; Farncomb, Robert F.; and Malotky, Lyle O., 4,349,396, Cl. 149-19.300.
Maly, George P.: *See*—
Bergstrom, Arthur E.; Nelson, Richard H.; and Maly, George P., 4,349,050, Cl. 138-147.000.
Mannesmann Demag Kunststofftechnik Zweigniederlassung der Mannesmann Demag Aktiengesellschaft: *See*—
Schirmer, Karl, 4,349,044, Cl. 137-512.300.
Manning, James M.; and Acharya, Seetharama A., to Rockefeller University. Test for glucosylated hemoglobin and other glucosylated proteins. 4,349,352, Cl. 23-230.00B.
Manweiler, Jack. Circular saw safety pusher device. 4,348,925, Cl. 83-435.100.
Marciniak, Franciszek, to Zaklady Telewizyjne Unitrapolkolor Osrodek Badawczo-Rozwojwy Techniki Telewizyjnej. Method and system for increasing the number of instructions transmitted in digital systems, I.A. in systems for remote control of television receivers. 4,349,841, Cl. 358-194.100.
Maringer, Melvin F.: *See*—
Biggs, James W.; and Maringer, Melvin F., 4,349,605, Cl. 428-389.000.
Mariyama, Ryoiti, to Sharp Kabushiki Kaisha. Cassette tape controlled microwave cooking apparatus. 4,349,715, Cl. 219-10.55B.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Flame retardant aromatic polyester-carbonate copolymer compositions. 4,349,658, Cl. 528-176.000.
Markley, Lowell D.; Tong, Yulan C.; and Wood, Steven G., to Dow Chemical Company, The. Sulfur-substituted diphenyl ethers having antiviral activity. 4,349,568, Cl. 424-330.000.
Marks, Helmuth: *See*—
Moll, Hans-Georg; Grohmann, Andreas; Hasselbarth, Ulrich; and Marks, Helmuth, 4,349,441, Cl. 210-512.100.
Marks, Stephen B., to University of Delaware. Glauber's salt heat storage compositions, crystal habit modifiers. 4,349,446, Cl. 252-70.000.
Marquez, Joseph A.: *See*—
Lee, Bong K.; Marquez, Joseph A.; and Waitz, J. Allan, 4,349,665, Cl. 536-7.100.
Marrs, James H. Farrowing pens. 4,348,986, Cl. 119-20.000.

Marsden (Proprietary) Limited: *See—*
Bain, Kenneth J. D.; King, Dennis E.; Worship, Lesley A.; and Burton, Achmat T., 4,349,117, Cl. 220-4.00F.

Marsden, Warwick L.: *See—*
Wainwright, Mark S.; Marsden, Warwick L.; and Friedrich, Jan B., 4,349,464, Cl. 252-463.000.

Marsen, Herman. Combined cooking and serving microwave apparatus. 4,349,713, Cl. 219-10.55A.

Martin, Peter: *See—*
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.

Martin, Robert P., Jr. Vine-type vegetation eradicator. 4,348,834, Cl. 47-58.000.

Maryland Cup Corporation: *See—*
Gilden, Morton, 4,349,400, Cl. 156-217.000.

Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Asphalt compositions modified with organo silane compounds. 4,349,388, Cl. 106-281.00N.

Marzocchi, Alfred: *See—*
Bolen, Charles E.; Harrington, Edward R.; Marzocchi, Alfred; and Roberts, Michael G., 4,349,590, Cl. 427-389.700.

Masch, Helmut E.: *See—*
Morse, Hugh B.; and Masch, Helmut E., 4,348,853, Cl. 53-566.000.

Mase, Akira: *See—*
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,349,641, Cl. 524-458.000.

Masri, Merle S.; Robinson, Brian; and Gibson, James D. M., to Wool Development International Limited. Wool scouring. 4,349,347, Cl. 8-139.000.

Massa, Frank, to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Means for detecting the accumulation of frost in a low temperature refrigeration system. 4,348,869, Cl. 62-140.000.

Masuda, Hisako: *See—*
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Masuda, Yoshihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation control valve. 4,349,003, Cl. 123-568.000.

Mataev, Arkady R.: *See—*
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; and Mataev, Arkady R., 4,349,431, Cl. 204-302.000.
Efimov, Vyacheslav T.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; Shamsha, Ljudmila F.; and Axenko, Alexandr A., 4,349,430, Cl. 204-302.000.

Mathew, Chempolil T.: *See—*
Belsky, Stephen E.; and Mathew, Chempolil T., 4,349,418, Cl. 203-45.000.

Matsuda, Hiroshi, to Nissan Diesel Kogyo Kabushiki Kaisha. Exhaust gas recirculation apparatus for diesel engine. 4,349,004, Cl. 123-569.000.

Matsumoto, Osamu: *See—*
Miyake, Hajime; Matsumoto, Osamu; and Dohi, Fumio, 4,349,091, Cl. 192-53.00F.

Matsumura, Yoshio; Nozue, Ikuo; and Ukachi, Takashi, to Japan Synthetic Rubber Co., Ltd. Doped acetylene polymer and process for production thereof. 4,349,664, Cl. 528-491.000.

Matsuno, Takashi: *See—*
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Matsuo, Takao: *See—*
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Matsuo, Yutaka: *See—*
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Yamashita, Yoshisato; and Matsuo, Yutaka, 4,349,525, Cl. 423-488.000.

Matsuoka, Hideoki; and Kondo, Yoshinobu, to Nissan Motor Co., Ltd.; and Fuji Kiko Co., Ltd. Covering structure of a guide rail for a seat belt. 4,349,215, Cl. 280-804.000.

Matsuoka, Hideoki: *See—*
Inasawa, Hideho; and Matsuoka, Hideoki, 4,349,214, Cl. 280-752.000.

Matsushita Electric Industrial Company, Limited: *See—*
Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,349,606, Cl. 428-411.000.
Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, 4,348,902, Cl. 73-626.000.

Matsushita Electric Works, Ltd.: *See—*
Oda, Takeshi; and Kikuchi, Hiroshi, 4,348,810, Cl. 30-210.000.

Matsuzaka, Syozi: *See—*
Koitabashi, Takeo; Matsuzaka, Syozi; and Iijima, Tashifumi, 4,349,622, Cl. 430-567.000.

Matsuzaki, Mikio: *See—*
Koyama, Yukio; Kondo, Tsutomu; Matsuzaki, Mikio; and Akizuki, Kunio, 4,349,247, Cl. 350-302.000.

Matteson, Thomas O.; and Wingate, David C., to Owens-Corning Fiberglas Corporation. Dual strand packaging apparatus. 4,349,365, Cl. 65-10.100.

Maugweiler, Gottfried: *See—*
Gut, Edwin; Arnold, Erwin; Maugweiler, Gottfried; and Friedli, Hans, 4,349,231, Cl. 299-69.000.

Maximenko, Alexandr V.; Torchilin, Vladimir P.; Smirnov, Vladimir N.; and Chazov, Evgeny I. Heat-resistant water soluble urokinase derivative. 4,349,630, Cl. 435-180.000.

Maxwell Laboratories, Inc.: *See—*
Fitch, Richard A.; Drummond, James E.; and Mondelli, Alfred A., 4,349,359, Cl. 55-151.000.

May, Paul W., Jr.: *See—*
Keeney, C. Neil; May, Paul W., Jr.; and Morgan, Albert W., 4,349,640, Cl. 524-294.000.

Mayer, Sigmund: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Schaffelhofer, Iwo, 4,349,417, Cl. 203-33.000.

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Kaman, Charles H.; and Mayerjak, Robert J., 4,348,933, Cl. 84-193.000.

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Maeda, Keisuke; Takechi, Keiji; and Oya, Tetsuro, 4,349,266, Cl. 354-295.000.
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Holden, M. James, 4,349,146, Cl. 229-2.50R.
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Morcos, Nabil A.; Haney, Thomas A.; and Wedeking, Paul W., to E. R. Squibb & Sons, Inc. Diagnostic and therapeutic capsules and method of producing. 4,349,529, Cl. 424-1.000.
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Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,349,635, Cl. 501-15.000.
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Shaw, Pern; and Musa, Fuad H., 4,349,870, Cl. 364-200.000.
Smith, Philip S., 4,349,888, Cl. 364-716.000.
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Smallegan, Jon M., 4,348,796, Cl. 29-432.000.
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Mundy, Joseph L.; Porter, Gilbert B., III; and Cipolla, Thomas M., to General Electric Company. Non-contact measurement of surface profile. 4,349,277, Cl. 356-376.000.
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Naillon, Bernard: *See*—
Fulchiron, Noel; and Naillon, Bernard, 4,348,936, Cl. 89-1.50D.
Naito, Junichiro; Yamamoto, Shinichi; Suzuki, Jitsuo; and Asano, Mitsuru, to Nippon Soken, Inc. Extrusion device for producing honeycomb structures. 4,349,329, Cl. 425-461.000.
Naitoh, Katsumi, to NSK-Warner K. K. Retractor provided with two types of emergency locking mechanism and take-up force locking means. 4,349,164, Cl. 242-107.40A.
Nakagawa Corporation: *See*—
Nakagawa, Shigesaburo, 4,348,861, Cl. 59-82.000.
Nakagawa, Shigesaburo, to Nakagawa Corporation. Jewelry chains by electro-forming. 4,348,861, Cl. 59-82.000.
Nakagawa, Tadashi: *See*—
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.
Nakaguchi, Osamu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko;

Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.
Nakahara, Yutaka; and Haruna, Tohru, to Adeka Argus Chemical Co., Ltd. Stabilizer for polyolefin resin. 4,349,468, Cl. 524-302.000.
Nakai, Masaaki: *See*—
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.
Nakai, Taiichiro: *See*—
Amano, Kitsutaro; Nakai, Taiichiro; Sato, Masanori; and Nunokawa, Makoto, 4,349,243, Cl. 350-96.230.
Nakajima, Kihei: *See*—
Otsuka, Kenichi; Uchino, Hiroshi; and Nakajima, Kihei, 4,349,867, Cl. 363-160.000.
Nakajima, Minoru: *See*—
Takeda, Shiro; and Nakajima, Minoru, 4,349,609, Cl. 428-429.000.
Nakajima, Toshio: *See*—
Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Nakajima, Toshio, 4,349,681, Cl. 546-304.000.
Nakamura, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Thin sheet feeding apparatus. 4,349,186, Cl. 271-18.000.
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Vertical type vapor-phase growth apparatus. 4,348,981, Cl. 118-730.000.
Nakata, Kazuo: *See*—
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Nakatani, Masaki: *See*—
Hiraga, Yoichi; Watanabe, Osamu; and Nakatani, Masaki, 4,349,519, Cl. 423-321.00S.
Nakatsuka, Kiyoharu; and Abeta, Sadaharu, to Sumitomo Chemical Company, Limited. Aqueous liquid composition of reactive dye. 4,349,349, Cl. 8-527.000.
Nalbandyan, Harutyun G. Harvesting tool. 4,348,808, Cl. 30-134.000.
Nankai Kogyo Kabushiki Kaisha: *See*—
Yaji, Saichi; Kitawaki, Kazuya; and Furuya, Takafumi, 4,349,052, Cl. 139-92.000.
Narayan, Thirumurti, to BASF Wyandotte Corporation. Process for the preparation of foams characterized by isocyanurate, and/or urethane linkages involving the use of alkali metal ammonium carboxylate catalysts. 4,349,638, Cl. 521-125.000.
Narayanamurti, Venkatesh: *See*—
Chin, Maurice A.; Narayanamurti, Venkatesh; and Stormer, Horst L., 4,349,796, Cl. 333-186.000.
National Distillers & Chemical Corp.: *See*—
Biggs, James W.; and Maringer, Melvin F., 4,349,605, Cl. 428-389.000.
Memering, Leroy J.; and Pritchett, Ervin G., 4,349,642, Cl. 524-524.000.
National Research Development Corporation: *See*—
Snee, Timothy J., 4,348,888, Cl. 73-23.000.
Staniforth, John N., 4,349,542, Cl. 424-153.000.
National Research Institute for Metals: *See*—
Amano, Muneyuki; and Sasaki, Yasuo, 4,349,527, Cl. 423-644.000.
National Semiconductor Corporation: *See*—
Bee, Edward C., 4,349,755, Cl. 307-492.000.
National Starch and Chemical Corp.: *See*—
Tessler, Martin M., 4,349,577, Cl. 426-590.000.
Nawata, Takanari: *See*—
Yoshikawa, Yoshio; Nawata, Takanari; Goto, Mikio; and Kondo, Yukio, 4,349,509, Cl. 422-57.000.
Nazarian, Miron M.: *See*—
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; and Mataev, Arkady R., 4,349,431, Cl. 204-302.000.
Efimov, Vyacheslav T.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; Shamsha, Ljudmila F.; and Axenko, Alexandr A., 4,349,430, Cl. 204-302.000.
Neff, Engelbert; and Laimer, Friedrich, to Netstal-Maschinen AG. Injection molding machine. 4,349,324, Cl. 425-149.000.
Nelson, Gerald V.: *See*—
Ganster, Charles A.; and Nelson, Gerald V., 4,349,884, Cl. 364-557.000.
Nelson, Richard H.: *See*—
Bergstrom, Arthur E.; Nelson, Richard H.; and Maly, George P., 4,349,050, Cl. 138-147.000.
Nemoto, Ken: *See*—
Noguchi, Tatsuhiko; Kurita, Ryuichi; Nemoto, Ken; and Endo, Kiichi, 4,349,447, Cl. 252-117.000.
Nestier Corporation: *See*—
Baldwin, Mark H., 4,349,171, Cl. 248-243.000.
Nestler, Gerhard: *See*—
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Harder, Wolfgang, 4,349,484, Cl. 260-453.00P.
Netstal-Maschinen AG: *See*—
Neff, Engelbert; and Laimer, Friedrich, 4,349,324, Cl. 425-149.000.
Neuzil, Richard W.; and Priegnitz, James W., to UOP Inc. Process for separating glucose from fructose by selective adsorption. 4,349,668, Cl. 536-127.000.
Newman, Brian A.: *See*—
Pae, Kook D.; Newman, Brian A.; and Scheinbeim, Jerry I., 4,349,502, Cl. 264-320.000.
Newton, Anthony D., to Motorola, Inc. Phase detector with low offsets. 4,349,756, Cl. 307-514.000.
NGK Spark Plug Co., Ltd.: *See*—
Nagashima, Teruyoshi; Takami, Akio; and Kasugai, Akiyo, 4,349,585, Cl. 427-125.000.
Nichols, Lawrence J.; and MacMaster, George H., to Raytheon Company. Slow wave coupling circuit. 4,349,791, Cl. 333-27.000.
Niederer, Kurt W., to Terrell Machine Company, The. Apparatus and method for winding yarn to form a package. 4,349,160, Cl. 242-18.00R.
Nihon Denshi Kabushiki Kaisha: *See*—
Ogura, Kazumichi, 4,349,242, Cl. 350-81.000.
Nilsson, Rolf E.: *See*—
Wahlstrom, Hans V.; Nilsson, Rolf E.; and Pihlgren, Kjell A., 4,348,781, Cl. 15-40.000.
Nimura, Takayasu: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Nippon Electric Co., Ltd.: *See*—
Hara, Hiroo; and Taguchi, Noboru, 4,349,908, Cl. 372-103.000.
Kouno, Akiyoshi; Morishita, Masanobu; and Yui, Yoshio, 4,349,844, Cl. 358-244.000.
Tada, Masahiro, 4,349,875, Cl. 364-200.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,349,786, Cl. 330-253.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwanami, Teruo; Takida, Hiroshi; and Fujita, Yukio, 4,349,644, Cl. 525-57.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Yazawa, Masahide; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,349,500, Cl. 264-159.000.
Nippon Soken, Inc.: *See*—
Naito, Junichiro; Yamamoto, Shinichi; Suzuki, Jitsuo; and Asano, Mitsuru, 4,349,329, Cl. 425-461.000.
Nippon Steel Corporation: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Nippondenso Co., Ltd.: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,349,854, Cl. 361-21.000.
Nishikawa, Yasuhisa: *See*—
Tanaka, Yoshio; Nishikawa, Yasuhisa; and Hasumi, Ryoichi, 4,348,911, Cl. 74-10.330.
Nishimura, Sanji: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,349,514, Cl. 423-54.000.
Nishimura, Toshifumi; and Sugihara, Kunihiko, to Nissan Motor Company, Limited. Vibration sensor for an automotive vehicle. 4,348,905, Cl. 73-654.000.
Nishimura, Yoshiharu: *See*—
Uchimura, Mitsuo; and Nishimura, Yoshiharu, 4,349,891, Cl. 364-900.000.
Nissan Diesel Kogyo Kabushiki Kaisha: *See*—
Matsuda, Hiroshi, 4,349,004, Cl. 123-569.000.
Nissan Motor Company, Limited: *See*—
Inasawa, Hideho; and Matsuoka, Hideoki, 4,349,214, Cl. 280-752.000.
Kanamori, Hiroshi, 4,349,591, Cl. 428-31.000.
Kawamoto, Tamio, 4,348,914, Cl. 74-467.000.
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,349,215, Cl. 280-804.000.
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Murakami, Shinichi; and Okumi, Kuniaki, 4,349,594, Cl. 428-43.000.
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Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,349,177, Cl. 251-230.000.
Takasaki, Masaru; and Imatomi, Keiichiro, 4,349,222, Cl. 285-363.000.
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,348,994, Cl. 123-198.00F.
Tsuru, Mario, 4,348,875, Cl. 464-170.000.
Nisso Industries Co. Ltd.: *See*—
Kuramoto, Kikuzo; and Enoki, Takahiro, 4,348,790, Cl. 24-211.00P.
Nitta, Hideo: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,349,581, Cl. 427-34.000.
NL Industries, Inc.: *See*—
Bates, H. John, 4,349,041, Cl. 137-1.000.
Nobuto, Shinichi: *See*—
Onishi, Masayoshi; Nobuto, Shinichi; Kawakami, Takashi; and Yamamoto, Shigemi, 4,349,007, Cl. 123-617.000.
Noda, Tsutomu: *See*—
Akitake, Isao; Noda, Tsutomu; and Yamazaki, Kazuhiko, 4,349,696, Cl. 179-1.0GS.
Nogami, Sadao: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,348,873, Cl. 62-514.00R.
Noguchi, Tatsuhiko; Kurita, Ryuichi; Nemoto, Ken; and Endo, Kiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Phosphate-free detergent composition. 4,349,447, Cl. 252-117.000.

Nolte, Albert; Schleiermacher, Herbert; and Arbeiter, Erich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for regulating the rotation of a hydraulically-operated cooling fan. 4,348,990, Cl. 123-41.120.

Nomaguchi, Hirotsugu: *See*—
Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, 4,349,618, Cl. 430-83.000.

Norfolk, Raymond W., to Spill-Fire Alarm Systems Ltd. Transducers. 4,349,282, Cl. 374-183.000.

Normier, Gerard: *See*—
D'Hinterland, Lucien D.; Serre, Hubert; and Normier, Gerard, 4,349,540, Cl. 424-92.000.

Norsk Hydro a.s.: *See*—
Olsen, Asbjorn L.; and Halvorsen, Sigbjorn T., 4,349,390, Cl. 148-6.15R.

North American Philips Corporation: *See*—
Bautista, Peter, Jr., 4,348,904, Cl. 73-644.000.
Stupp, Edward H.; and Lalak, Joseph, 4,349,410, Cl. 156-654.000.

Northern Telecom Limited: *See*—
Kuhfus, Gerd, 4,349,705, Cl. 179-90.00L.
Thompson, Joseph, 4,349,706, Cl. 179-100.00C.
Zuber, Bretislav; and Kral, Jaroslav J., 4,349,780, Cl. 324-262.000.

Norton, Larry A.: *See*—
West, Frank L.; and Norton, Larry A., 4,349,856, Cl. 361-160.000.

Novanex Automation N.V.: *See*—
Laupman, Robert R., 4,349,787, Cl. 330-284.000.

November, Milton H.; Lyon, LaVern D.; and Ponzi, Joseph J., to International Telephone and Telegraph Corporation. Vibration instruments. 4,349,881, Cl. 364-509.000.

Novikov, Nikolai V.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

Nowak, Frederick H.: *See*—
Bittar, Joseph; and Nowak, Frederick H., 4,349,087, Cl. 187-29.00R.

Nozawa, Koji, to Nissan Motor Company, Limited. Transmission for a vehicle. 4,348,913, Cl. 74-339.000.

Nozue, Ikuo: *See*—
Matsumura, Yoshio; Nozue, Ikuo; and Ukachi, Takashi, 4,349,664, Cl. 528-491.000.

NSK-Warner K. K.: *See*—
Naitoh, Katsumi, 4,349,164, Cl. 242-107.40A.

Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., to Research Foundation of State University of New York. Water insoluble disinfectant composition. 4,349,646, Cl. 525-256.000.

Nunokawa, Makoto: *See*—
Amano, Kitsutaro; Nakai, Taiichiro; Sato, Masanori; and Nunokawa, Makoto, 4,349,243, Cl. 350-96.230.

Nussbaum, Joel H., to Standard Products Company, The. Thermoplastic elastomer molding. 4,349,592, Cl. 428-31.000.

Nutzel, Hans G.; and Kuhl, Rudolf, to SKF Industrial Trading & Development Co. B.V. Process for decomposing hard metal scrap. 4,349,423, Cl. 204-146.000.

Nyenbrink, Willard: *See*—
Jones, Stanley; and Nyenbrink, Willard, 4,348,835, Cl. 49-139.000.

Obinata, Akio; and Ohsawa, Satoshi, to Orion Machinery Co., Ltd. Combustion control device for nozzle spray type burner. 4,349,330, Cl. 431-60.000.

Obrist, Albert; and Breuer, Hans-Werner, to Albert Obrist AG. Injection mold apparatus for containers of plastics material. 4,349,174, Cl. 249-58.000.

Obrist, Albert; Blaesi, Max; and Auer, Serge, to Albert Obrist AG. Method and apparatus for shrinking a container closure. 4,349,399, Cl. 156-86.000.

Occidental Chemical Corporation: *See*—
Huvar, Robert J., 4,349,392, Cl. 148-6.200.

Occidental Oil Shale: *See*—
Langford, William D., 4,349,227, Cl. 299-2.000.

Ochi, Hideo: *See*—
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,349,647, Cl. 525-285.000.

Ochiai, Chiaki, to Aisin Seiki Kabushiki Kaisha. Brake booster. 4,348,944, Cl. 91-369.00A.

Ochiai, Shinya, to Celanese Corporation. Control of anaerobic filter. 4,349,435, Cl. 210-96.100.

Oda, Takeshi; and Kikuchi, Hiroshi, to Matsushita Electric Works, Ltd. Blade part assembling structure for electric shaver. 4,348,810, Cl. 30-210.000.

Officine Minnetti di Ornella Raveggi & C.S.a.s.: *See*—
Minnetti, Federico, 4,349,309, Cl. 414-744.00A.

Ogata, Saburo. Tuning device for stringed musical instruments. 4,348,934, Cl. 84-306.000.

Ogawa, Haruki: *See*—
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Ogawa, Hiroyuki; and Kaki, Haruhiko, to Asahi Glass Company, Ltd. Automatic glass plate piling apparatus. 4,349,304, Cl. 414-106.000.

Ogawa, Kazutake: *See*—
Shimada, Junichi; and Ogawa, Kazutake, 4,349,078, Cl. 180-69.100.

Ogawa, Mitsuru; and Iwamatsu, Seiichi, to VLSI Technology Research Association. Method of fabricating an integrated circuit device utilizing electron beam irradiation and selective oxidation. 4,348,804, Cl. 29-580.000.

Ogawa, Tetsuya: *See*—
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, 4,349,409, Cl. 156-643.000.

Ogura, Kazumichi, to Nihon Denshi Kabushiki Kaisha. Specimen observation apparatus including an optical microscope and a scanning electron microscope. 4,349,242, Cl. 350-81.000.

Ohashi, Toshio: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,349,177, Cl. 251-230.000.

Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, to Hitachi, Ltd. Solid-state imaging device. 4,349,743, Cl. 250-578.000.

Ohio State University, The: *See*—
Royer, Garfield P., 4,349,530, Cl. 424-19.000.

Ohio State University Research Foundation, The: *See*—
Shore, Sheldon G.; and Nagel, Colleen C., 4,349,521, Cl. 423-417.000.
Shore, Sheldon G.; and Plotkin, Jeffrey S., 4,349,522, Cl. 423-417.000.

Ohmae, Tadayuki; Murakami, Teruhiko; and Kanno, Yoshinori, to Sumitomo Chemical Company, Limited. Powder coating composition. 4,349,654, Cl. 526-273.000.

Ohsawa, Mitsuo, to Sony Corporation. Tantalum condenser. 4,349,860, Cl. 361-310.000.

Ohsawa, Satoshi: *See*—
Obinata, Akio; and Ohsawa, Satoshi, 4,349,330, Cl. 431-60.000.

Ohtaka, Mihoko: *See*—
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Ohtani, Masami, to Dainippon Screen Mfg. Co., Ltd. Processing solution circulating device for film processor. 4,349,267, Cl. 354-323.000.

Oil Process Systems, Inc.: *See*—
Blumenthal, Michael M.; and Stockler, Jerry R., 4,349,353, Cl. 23-230.00R.

Oishi, Akira. Hang strap for portable instrument. 4,349,139, Cl. 224-257.000.

Okada, Osamu, to Minolta Camera Kabushiki Kaisha. Manual paper feed inhibiting device in electrographic copying machine. 4,349,269, Cl. 355-14.0SH.

Okada, Satoshi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.

Okada, Tsutomu; Hishida, Tadashi; and Muramatsu, Minoru, to Mitsubishi Chemical Industries Limited. Method for assaying fatty acids. 4,349,625, Cl. 435-4.000.

Okajima, Tadishi. Water conveyance. 4,348,977, Cl. 114-273.000.

Okazaki, Hiroshi: *See*—
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Okinaka, Yutaka, to Bell Telephone Laboratories, Incorporated. Etch procedure for aluminum alloy. 4,349,411, Cl. 156-659.100.

Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Agent for protecting the surface of lithographic printing plate. 4,348,954, Cl. 101-465.000.

Okumi, Kuniaki: *See*—
Murakami, Shinichi; and Okumi, Kuniaki, 4,349,594, Cl. 428-43.000.

Okuzawa, Tugio: *See*—
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.

Oldendorf, Christian; and Melcher, Franz-Josef, to Sartorius GmbH. Change-over switch with de-chattering device for electronic weighing scales. 4,349,076, Cl. 177-164.000.

Olin Corporation: *See*—
Casberg, John M.; and Putnam, Clair H., 4,349,493, Cl. 264-37.000.
Ollivier, Jean; and Bosch, Yves, 4,349,141, Cl. 227-10.000.
Rothgery, Eugene F., 4,349,458, Cl. 252-391.000.
Saeman, Walter C., 4,349,366, Cl. 65-27.000.

Ollivier, Jean; and Bosch, Yves, to Olin Corporation. Piston return for powder actuated piston tool. 4,349,141, Cl. 227-10.000.

Olmr, Jaroslav J., to Textron Inc. Safety saw chain. 4,348,927, Cl. 83-833.000.

Olsen, Asbjorn L.; and Halvorsen, Sigbjorn T., to Norsk Hydro a.s. Method for the electrolytical metal coating of magnesium articles. 4,349,390, Cl. 148-6.15R.

Olson, Gary L.: *See*—
Berger, Leo; and Olson, Gary L., 4,349,678, Cl. 546-150.000.

Olsson, Per O. Method and apparatus for the production of fancy yarn. 4,348,859, Cl. 57-401.000.

Olympus Optical Co., Ltd.: *See*—
Koyata, Kenzi, 4,349,032, Cl. 128-660.000.
Satoh, Ken, 4,349,849, Cl. 360-71.000.
Takamatsu, Takeshi, 4,349,014, Cl. 128-6.000.
Takayama, Syuichi, 4,349,255, Cl. 354-31.000.

Omnimed, Inc.: *See*—
Schattner, Robert L.; and Schattner, Allen S., 4,348,967, Cl. 109-51.000.

Onishi, Masayoshi; Nobuto, Shinichi; Kawakami, Takashi; and Yamamoto, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Internal combustion engine ignition device. 4,349,007, Cl. 123-617.000.
Onksen, Peter J.; and Spadafora, Leonard, to Pacer Systems, Inc. Temperature sensor assembly apparatus. 4,349,281, Cl. 374-136.000.
Ono, Sadao, to Clarion Co., Ltd. Volume control apparatus. 4,349,779, Cl. 323-318.000.
Opitz, Wolfgang: *See*—
Jacobi, Haireddin; Opitz, Wolfgang; and Etschenberg, Eugen, 4,349,543, Cl. 424-177.000.
Optische Werke G. Rodenstock: *See*—
Gelius, Siegfried, 4,349,250, Cl. 351-32.000.
Orbans, Joseph M. W. Safety device for electrodes of an electric steelmaking furnace. 4,349,911, Cl. 373-105.000.
Orillion, Michael T., to Dow Chemical Co., The. Corrosion protection for metal surfaces. 4,349,457, Cl. 252-389.00R.
Orion Industries, Inc.: *See*—
Muller, Leslie D., 4,348,899, Cl. 73-431.000.
Orion Machinery Co., Ltd.: *See*—
Obinata, Akio; and Ohsawa, Satoshi, 4,349,330, Cl. 431-60.000.
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Knotik, Karl; Leichter, Peter; and Glock, Johann, 4,349,412, Cl. 159-47.0WL.
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Dunn, Charles S.; and Hohman, Charles M., 4,349,376, Cl. 65-345.000.
Heubach, Edward C., 4,349,332, Cl. 432-179.000.
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P A Management Consultants Limited: *See*—
Lewis, Christopher M., 4,349,095, Cl. 194-100.00A.
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Buckstead, John W.; Hoppe, Frederick J.; and Williams, Dennis W., 4,349,308, Cl. 414-725.000.
Pacer Systems, Inc.: *See*—
Onksen, Peter J.; and Spadafora, Leonard, 4,349,281, Cl. 374-136.000.
Pacht, Amos, to Butterworth, Inc. Power assisted dump valve. 4,349,154, Cl. 239-124.000.
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Panaia, Raymond R.: *See*—
Cole, Jean R.; and Panaia, Raymond R., 4,348,953, Cl. 101-128.210.
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Schumaker, Jon S., 4,349,151, Cl. 238-349.000.
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Small, Rudolph E.; and Spalding, Michael H., 4,349,185, Cl. 270-32.000.
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Bodendoerfer, Raymond E., 4,349,345, Cl. 493-295.000.
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Parker, Daniel, to Beloit Corporation. Method for waterproofing paper. 4,349,610, Cl. 428-447.000.
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Ewig, John F., 4,349,143, Cl. 227-131.000.
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Pavljuchenko, Valery N.; Pessina, Zinaida M.; Vasilieva, Elena D.; and Ivanchev, Sergei S. Process of preparing copolymers of butyl acrylate and 1-(α-alkyl acrylate)-1-tert-butyl peroxy ethanes. 4,349,649, Cl. 526-234.000.
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Wiknich, Douglas D.; and Peabody, Michael J., 4,349,099, Cl. 198-751.000.
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Sondermeyer, Jack C., 4,349,788, Cl. 330-293.000.
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Penn-Gil Fabrics, Inc.: *See*—
Blechstein, Amihud, 4,349,593, Cl. 428-40.000.
Pennwalt Corporation: *See*—
Sandler, Stanley R., 4,349,688, Cl. 560-91.000.
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Cliff, Geoffrey R.; Hunt, Russell G.; and Percival, Albert, 4,349,378, Cl. 11-103.000.
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Kellar, John D.; and Pereman, Gordon F., 4,349,375, Cl. 65-291.000.
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Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,349,581, Cl. 427-34.000.
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Peterson, Guy E. Portable shower. 4,348,777, Cl. 4-596.000.
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Garner, Robert; and Petitpierre, Jean C., 4,349,218, Cl. 282-27.500.
Peuron, Unto A.: *See*—
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ing visually observable information present on a data carrier. 4,349,730, Cl. 235-472.000.

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Altmann, Garhard; and Pfeiffer, Richard, 4,349,801, Cl. 336-84.00C.

Pfleiderer, Hans-Joerg; and Klar, Heiner, to Siemens Aktiengesellschaft. Integrated circuit for transferring complementary charge packets between two charge transfer devices. 4,349,749, Cl. 307-221.00D.

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Leitermann, Wulf; and Pflugfelder, Karl, 4,348,915, Cl. 74-473.00R.

Philip Morris Incorporated: *See—*
Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.

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Alferness, Clifton A., 4,349,015, Cl. 128-28.000.

Pierre Fabre S.A.: *See—*
D'Hinterland, Lucien D.; Serre, Hubert; and Normier, Gerard, 4,349,540, Cl. 424-92.000.

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Owen, Harry; and Ellis, Edric, 4,349,634, Cl. 501-13.000.

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French, Kenneth; and Piorkow, Alfred, 4,349,278, Cl. 356-394.000.

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Pissiotas, Georg: *See—*
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Pitney Bowes, Inc.: *See—*
Macaluso, Paul J.; and Genthe, James E., 4,349,132, Cl. 222-156.000.

Plas Plugs Limited: *See—*
Hepworth, Paul S.; and Whitehouse, Martin G., 4,349,059, Cl. 145-33.00A.

Plastic Recycling Limited: *See—*
Mair, William J., 4,349,325, Cl. 425-363.000.

Plempel, Manfred: *See—*
Boshagen, Horst; Buchel, Karl H.; Draber, Wilfried; Haller, Ingo; and Plempel, Manfred, 4,349,560, Cl. 424-273.00R.

Plessey Handel und Investments AG: *See—*
Richardson, Christopher K., 4,349,919, Cl. 455-23.000.

Plotkin, Jeffrey S.: *See—*
Shore, Sheldon G.; and Plotkin, Jeffrey S., 4,349,522, Cl. 423-417.000.

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Chipman, Donald M.; and Bales, Ray D., 4,349,054, Cl. 141-1.000.

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Dinella, Donald; Haller, Albert H.; and Polakowski, Theodore D., Jr., 4,349,589, Cl. 427-359.000.

Polaroid Corporation: *See—*
Friedman, Melvin; and Holmes, William A., 4,349,257, Cl. 354-126.000.

Polymer Processing Research Institute, Ltd.: *See—*
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Ponzi, Joseph J.: *See—*
November, Milton H.; Lyon, LaVern D.; and Ponzi, Joseph J., 4,349,881, Cl. 364-509.000.

Porter, Gilbert B., III: *See—*
Mundy, Joseph L.; Porter, Gilbert B., III; and Cipolla, Thomas M., 4,349,277, Cl. 356-376.000.

Possati, Mario; Golinelli, Guido; and Selleri, Narciso, to Finike Italiana Marposs, S.p.A. Gauge for checking linear sizes of mechanical parts. 4,348,814, Cl. 33-178.00E.

Post, John E.: *See—*
Foster, Glenn B.; and Post, John E., 4,348,868, Cl. 62-101.000.

Powell, James E.; and Sanborn, James R., to Shell Oil Company. Insecticidal synergist. 4,349,676, Cl. 546-141.000.

PPG Industries, Inc.: *See—*
Kellar, John D.; and Pereman, Gordon F., 4,349,375, Cl. 65-291.000.
Krumwiede, John F., 4,349,367, Cl. 65-27.000.
Lord, Tom J.; and Snyder, William V., 4,348,799, Cl. 29-450.000.

PQ Corporation: *See—*
Dent, Anthony L.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,349,533, Cl. 424-52.000.

Prakken, Bouwe. Packing machine for the production of filled sealed bags. 4,348,851, Cl. 53-75.000.

Pratt, Hugh W.: *See—*
Scordato, Emil A.; and Pratt, Hugh W., 4,349,109, Cl. 206-562.000.

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Bowles, Arnold G., 4,349,333, Cl. 432-205.000.

Prett, David M.; Ramaker, Brian L.; and Cutler, Charles R., to Shell Oil Company. Dynamic matrix control method. 4,349,869, Cl. 364-159.000.

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Adams, Keith J. G.; Brightwell, Alan; Price, Barry L.; Pegler, Stuart M.; and Weall, Paul, 4,349,745, Cl. 307-12.000.

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Prikhna, Alexei I.: *See—*
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Pritchett, Ervin G.: *See—*
Memering, Leroy J.; and Pritchett, Ervin G., 4,349,642, Cl. 524-524.000.

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Procter & Gamble Company, The: *See—*
Amneus, John S., 4,349,129, Cl. 222-41.000.
Heino, Jorgen, 4,349,056, Cl. 141-381.000.

Protomastro, Michael G.: *See—*
Stefanucci, Arthur; and Protomastro, Michael G., 4,349,573, Cl. 426-388.000.

PT Components, Inc.: *See—*
Stephanoff, Louis J.; and Avramidis, Stellios A., 4,349,343, Cl. 474-245.000.

Pullman Incorporated: *See—*
Johnson, Gorden F., 4,348,910, Cl. 73-863.510.

Putnam, Clair H.: *See—*
Casberg, John M.; and Putnam, Clair H., 4,349,493, Cl. 264-37.000.

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English, Martin; Pym, David P.; and Dawson, Lindsay G., 4,349,628, Cl. 435-161.000.

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Queen's University at Kingston: *See—*
Romero-Sierra, Cesar; and Webb, John C., 4,349,459, Cl. 252-400.00R.
Romero-Sierra, Cesar; and Webb, John C., 4,349,580, Cl. 427-4.000.

Rabiner, Lawrence R.: *See—*
Pirz, Frank C.; and Rabiner, Lawrence R., 4,349,700, Cl. 179-1.0SD.

Rabinovitch, Irving: *See—*
Worne, Howard E.; and Rabinovitch, Irving, 4,349,633, Cl. 435-281.000.

Raboud, Pierre-Benoit; Kubicek, Frantisek; and Bandi, Jean-Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for solubilizing cocoa. 4,349,579, Cl. 426-631.000.

Racine Federated, Inc.: *See—*
Lake, Jack E., 4,349,711, Cl. 200-153.0LA.

Ragen, Robert A., to Xerox Corporation. Electronic damping apparatus. 4,349,770, Cl. 318-685.000.

Raible, Donald A., to Bentley Laboratories. Atraumatic blood access device valve. 4,349,021, Cl. 128-214.00R.

Ralston, Philip G., Jr. Multiple adapter device for interconnecting tubing of different sizes. 4,349,024, Cl. 128-247.000.

Ramaker, Brian L.: *See—*
Prett, David M.; Ramaker, Brian L.; and Cutler, Charles R., 4,349,869, Cl. 364-159.000.

Ramsey, Maynard, III, to Johnson & Johnson. Automatic mean blood pressure reading device. 4,349,034, Cl. 128-681.000.

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Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,349,145, Cl. 228-208.000.

Randolph, Robert W., to ACF Industries, Inc. Sliding sill low friction supporting plate assembly. 4,348,964, Cl. 105-42.00D.

Rasmussen, Glenn: *See—*
Huston, Larry; Morrison, Clifton H.; Rasmussen, Glenn; and Tsuchiya, Takuzo, 4,348,923, Cl. 83-23.000.

Rau, Joseph P. Emergency toilet water protection unit. 4,348,778, Cl. 4-661.000.

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Rawls, John M.; and Peuron, Unto A., to United States of America, Energy. Thermomagnetic burn control for magnetic fusion reactor. 4,349,506, Cl. 376-142.000.

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Furbish, William B.; and Baker, Roscoe E., 4,349,323, Cl. 425-147.000.

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Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, 4,349,404, Cl. 156-308.400.

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Bixler, Stephen D.; Thomas, David T.; and Archer, Donald H., 4,349,827, Cl. 343-786.000.
Gordon, Bruce E., 4,349,918, Cl. 455-20.000.
Nichols, Lawrence J.; and MacMaster, George H., 4,349,791, Cl. 333-27.000.

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Bull, Jeffrey F., 4,349,754, Cl. 307-443.000.
Crowley, Albert T., 4,349,887, Cl. 364-703.000.
Faith, Thomas J., Jr., 4,348,886, Cl. 73-19.000.
Flatley, Doris W.; and Hsu, Sheng T., 4,349,584, Cl. 427-85.000.
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Landry, Norman R., 4,349,790, Cl. 333-24.100.
Southgate, Peter D.; and Beltz, John P., 4,349,880, Cl. 364-507.000.
Tarng, Ming L.; and Hicinbothem, Walter A., Jr., 4,349,408, Cl. 156-628.000.
Valachovic, John; Alphonse, Gerard A.; Reisner, John H.; and Etzold, Karl-Friedrich, 4,349,902, Cl. 369-132.000.

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Redifon Simulation Limited: *See*—
Spooner, Archer M., 4,349,815, Cl. 340-705.000.

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Rees, James D., to Xerox Corporation. Gradient index lens array with improved exposure uniformity. 4,349,248, Cl. 350-413.000.

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Leorat, Francois J., 4,349,320, Cl. 417-237.000.

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Stang, John H.; Ruthmansdorfer, David A.; and Reichenbach, Dean H., 4,348,991, Cl. 123-41.290.

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Reim, Paul. Frame for pictures and the like. 4,348,826, Cl. 40-155.000.

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Forte, Luciano, 4,349,752, Cl. 307-254.000.

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Fohl, Artur, 4,349,217, Cl. 280-808.000.

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Demianczuk, Dionisyj; McLean, Gregory J.; and Franklin, Joseph E., 4,348,800, Cl. 29-527.700.

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Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,349,646, Cl. 525-256.000.

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Schildknecht, Richard J., 4,349,012, Cl. 126-422.000.

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Osman, Maged A.; and Revesz, Laszlo, 4,349,452, Cl. 252-299.610.

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McLean, John R., 4,349,100, Cl. 198-783.000.

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Bremer, Clemens; and Klumpp, Walter, 4,348,940, Cl. 89-140.000.
Kuffer, Hans, 4,348,937, Cl. 89-24.000.

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Lindow, Edwin L.; and Richards, Bradley T., 4,349,717, Cl. 219-73.200.

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Rickett, David A. Automatic and continuous chemical feed system. 4,349,437, Cl. 210-169.000.

Ricoh Co., Ltd.: *See*—
Hirose, Akira, 4,348,786, Cl. 16-75.000.
Kaneko, Tamaki; Hibi, Kunio; Ikeda, Sunao; Okuzawa, Tugio; Kakitani, Yohtaro; and Kikuchi, Hideo, 4,349,190, Cl. 271-297.000.
Sasaki, Masaomi, 4,349,616, Cl. 430-58.000.
Sekigawa, Keiji, 4,349,846, Cl. 358-280.000.

Riddle, Travis: *See*—
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,349,662, Cl. 528-301.000.

Rigdahl, Hans M.: *See*—
Kubat, Josef; Rigdahl, Hans M.; and Djurner, Jan K., 4,349,504, Cl. 264-328.170.

Riggers Manufacturing Co.: *See*—
Lampson, Neil F., 4,349,115, Cl. 212-178.000.

Ringsdorff-Werke GmbH: *See*—
Weinert, Hans, 4,349,384, Cl. 75-208.00R.

Ritter, Ernst: *See*—
Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, 4,348,895, Cl. 73-119.00A.

Robert Bosch GmbH: *See*—
Holzbaur, Siegfried; Barth, Horst; and Oamera, Josef, 4,348,999, Cl. 123-452.000.
Leiber, Heinz, 4,349,079, Cl. 180-143.000.
Liede, Dieter, 4,349,508, Cl. 422-1.000.
Schuhmacher, Werner, 4,348,945, Cl. 91-452.000.
Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, 4,348,895, Cl. 73-119.00A.
Stumpp, Gerhard, 4,348,998, Cl. 123-447.000.

Roberts, David: *See*—
Changani, Pushpkumar D.; Peacock, Donald G.; and Roberts, David, 4,349,404, Cl. 156-308.400.

Roberts, Lincoln E.; and Wasserlein, Henry G., Jr., to AMP Incorporated. Low mating force connector for connecting groups of wires. 4,349,239, Cl. 339-97.00R.

Roberts, Michael G.: *See*—
Bolen, Charles E.; Harrington, Edward R.; Marzocchi, Alfred; and Roberts, Michael G., 4,349,590, Cl. 427-389.700.
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,349,388, Cl. 106-281.00N.

Robinson, Brian: *See*—
Masri, Merle S.; Robinson, Brian; and Gibson, James D. M., 4,349,347, Cl. 8-139.000.

Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., to Bliss & Laughlin Industries, Incorporated. Self-oiling portable bag-closing sewing machine. 4,348,970, Cl. 112-256.000.

Robson, William F.; and Laperle, Raymond A. Ground isolated electrostatic field detector. 4,349,783, Cl. 324-457.000.

Rockefeller University: *See*—
Manning, James M.; and Acharya, Seetharama A., 4,349,352, Cl. 23-230.00B.

Rockwell International Corporation: *See*—
Blocksome, Roderick K.; Hornbeck, Sherman J.; and Fee, Donald R., 4,349,799, Cl. 333-246.000.
Wagner, William R., 4,349,001, Cl. 123-557.000.

Rockwell-Rimoldi, S.p.A.: *See*—
Fonio, Carlo, 4,349,306, Cl. 414-684.000.

Roeder, Allan W., to United States of America, Air Force. Adaptive interference tracker for suppression of narrow band interference. 4,349,916, Cl. 375-103.000.

Rohan, Neil A.: *See*—
Morgan, Edward J.; and Rohan, Neil A., 4,349,341, Cl. 440-51.000.

Rohde, Edward C., to Consolidation Coal Company. Method for dewatering a subterranean formation via a borehole. 4,349,228, Cl. 299-10.000.

Rohr, Otto: *See*—
Durr, Dieter; Rohr, Otto; Pissiotas, Georg; and Bohner, Beat, 4,349,377, Cl. 71-98.000.

Rohrbach, Peter H., to SI Handling Systems, Inc. Fail-safe control device for driverless vehicles. 4,348,961, Cl. 104-252.000.

Romankiw, Lubomyr T.: *See*—
Kulynych, Larysa H.; Romankiw, Lubomyr T.; and von Gutfeld, Robert J., 4,349,583, Cl. 427-53.100.

Romero-Sierra, Cesar; and Webb, John C., to Queen's University at Kingston. Lower preservation. 4,349,459, Cl. 252-400.00R.

Romero-Sierra, Cesar; and Webb, John C., to Queen's University at Kingston. Process and solution for preserving green plant tissues. 4,349,580, Cl. 427-4.000.

Rommel, Emil: *See*—
Ketterer, Dieter; Jakubaschk, Horst; and Rommel, Emil, 4,348,941, Cl. 89-155.000.

Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,349,561, Cl. 424-274.000.

Rosenberger, Hugo. Compound block kit. 4,349,293, Cl. 404-41.000.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Dithiophosphates as lubricant antioxidents and anti-corrosion agents. 4,349,445, Cl. 252-46.600.

Roser, Erich. Oil lubrication system. 4,349,085, Cl. 184-6.150.

Ross Operating Valve Company: *See*—
Thornton, Douglas M., 4,349,176, Cl. 251-129.000.

Rossi, Pier P.; and Catoni, Mario, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the preparation of ω-lactams, in particular caprolactam. 4,349,473, Cl. 260-239.30A.

Roszkowski, Adolph P.; Clark, Robin D.; and Kluge, Arthur F., to Syntex (U.S.A.) Inc. Anti-hypertensive 1-substituted spiro(piperidine-oxobenzoxazine)s. 4,349,549, Cl. 424-248.550.

Roth, Eldon N. Method for freezing and forming meat patties. 4,349,575, Cl. 426-513.000.

Roth, Josef, to Karl Mayer Textilmaschinen fabrik GmbH. Weft thread laying apparatus. 4,348,876, Cl. 66-84.00A.

Roth, Kurt: *See*—
Tappe, Horst; Kindler, Horst; Roth, Kurt; and Weyer, Hans-Jurgen, 4,349,348, Cl. 8-464.000.
Rothgery, Eugene F., to Olin Corporation. Selected poly(oxyalkylated) 1,3,4-thiadiazoles in acid baths and their use as corrosion inhibitors. 4,349,458, Cl. 252-391.000.
Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,349,037, Cl. 131-306.000.
Roto-Finish Company, Inc.: *See*—
Balz, Gunther W., 4,349,327, Cl. 425-436.00R.
Rottmayr, Johann, to Zinser Textilmaschinen GmbH. Method of and apparatus for making a doubled yarn. 4,348,858, Cl. 57-18.000.
Roussel Uclaf: *See*—
Gouin d'Ambrieres, Solange; Lutz, Andre; and Gasc, Jean-Claude, 4,349,545, Cl. 424-180.000.
Rovsha, Vyacheslav S.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.
Rowe, Frederick; and Brown, David, to Imperial Chemical Industries Limited. Pyrolysis of hydrocarbons. 4,349,432, Cl. 208-130.000.
Rowley, Edward K.; and Sprague, Allison A., to C-I-L Inc. Explosive container. 4,348,955, Cl. 102-317.000.
Royer, Garfield P., to Ohio State University, The. Implants, microbeads, microcapsules, preparation thereof and method of administering a biologically-active substance to an animal. 4,349,530, Cl. 424-19.000.
Rudd, Robert E., III, to Burroughs Corporation. Conical nozzle for an electrostatic ink jet printer. 4,349,830, Cl. 346-140.00R.
Rupp, Wiktor J., to Camelot Industries Corporation. Method and apparatus for manufacturing glass progressive lenses. 4,349,374, Cl. 65-107.000.
Russell, George K., to Stanley Aviation Corporation. Apparatus and method for fractionating air and other gaseous mixtures. 4,349,357, Cl. 55-21.000.
Ruthmansdorfer, David A.: *See*—
Stang, John H.; Ruthmansdorfer, David A.; and Reichenbach, Dean H., 4,348,991, Cl. 123-41.290.
Rutt, Kenneth M. Animal cart. 4,349,210, Cl. 280-47.210.
Ryan, Kenneth M.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,349,687, Cl. 549-291.000.
Ryding, Paul A.: *See*—
Glassman, Stephen M.; Kia, James D.; and Ryding, Paul A., 4,349,016, Cl. 128-87.00R.
S&C Electric Company: *See*—
Tobin, Thomas J., 4,349,803, Cl. 337-186.000.
S.C.R. Engineers Ltd.: *See*—
Brayer, Eyal, 4,348,984, Cl. 119-14.080.
Saeman, Walter C., to Olin Corporation. Glass batch pellet production and drying process. 4,349,366, Cl. 65-27.000.
Sahara, Masayoshi: *See*—
Ishida, Tokuji; and Sahara, Masayoshi, 4,349,260, Cl. 354-145.000.
Sakamoto, Hiroshi: *See*—
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Misumi, Akira; and Fukushima, Hiroshi, 4,349,766, Cl. 313-346.00R.
Sakashita, Noriji; Kugisawa, Toshio; Watanabe, Hironori; and Kitagawa, Hiroshi, to Kabushiki Kaishi Kawai Gakki Seisakusho. Electronic musical instrument. 4,348,928, Cl. 84-1.010.
San-O Industrial Co., Ltd.: *See*—
Arikawa, Hiroo, 4,349,805, Cl. 337-255.000.
Sanborn, James R.: *See*—
Powell, James E.; and Sanborn, James R., 4,349,676, Cl. 546-141.000.
Sanders, David C.: *See*—
Dentel, David A.; and Sanders, David C., 4,349,488, Cl. 260-465.00D.
Sanders, Laurence R., to McDonnell Douglas Corporation. Shielded structural or containment member. 4,349,859, Cl. 361-218.000.
Sanderson, Roger S.; and Whelchel, Robert C., to Sanderson, Roger S. Sterilizing and storing medical items. 4,349,118, Cl. 220-201.000.
Sandler, Stanley R., to Pennwalt Corporation. Polyoxyalkylene polycarboxylate esters. 4,349,688, Cl. 560-91.000.
Sanfilippo, Jasper B. Movably mounted dispenser for bulk material. 4,349,128, Cl. 222-166.000.
Sapitowicz, Thomas P.; and Meloni, Robert A., to General Instrument Corporation. Hammer for dot matrix printer. 4,349,283, Cl. 400-124.000.
Sarides, Athanase K. Apparatus for indicating pressure in pneumatic tires. 4,348,896, Cl. 73-146.500.
Sarjeant, Dale C. Collapsible splash shield for toilet. 4,348,776, Cl. 4-300.300.
Sartorius GmbH: *See*—
Oldendorf, Christian; and Melcher, Franz-Josef, 4,349,076, Cl. 177-164.000.
Sarvestany, Asadollah A.: *See*—
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda, 4,349,159, Cl. 241-236.000.
Sasaki, Masaomi, to Ricoh Co., Ltd. Disazo pigment containing electrophotographic element. 4,349,616, Cl. 430-58.000.
Sasaki, Masaru: *See*—
Higashiyama, Noboru; and Sasaki, Masaru, 4,349,851, Cl. 360-105.000.
Sasaki, Nobuo, to Fujitsu Limited. Process for producing a semiconductor device having an identification mark in an insulating substrate. 4,348,803, Cl. 29-574.000.
Sasaki, Soji: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Sasaki, Yasuo: *See*—
Amano, Muneyuki; and Sasaki, Yasuo, 4,349,527, Cl. 423-644.000.
Sasaki, Yukito: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Sasaoka, Takeshi: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; and Shimane, Koichi, 4,349,835, Cl. 358-76.000.
Satharasinghe, Dayananda: *See*—
Hardwick, John P.; Pezet, Michael J.; Sarvestany, Asadollah A.; and Satharasinghe, Dayananda, 4,349,159, Cl. 241-236.000.
Sato, Akio: *See*—
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,349,061, Cl. 152-209.00R.
Sato, Hideo: *See*—
Kondo, Syunichi; Nomaguchi, Hirotsugu; and Sato, Hideo, 4,349,618, Cl. 430-83.000.
Sato, Hirokazu: *See*—
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, to Nippon Steel Corporation; and Hitachi, Ltd. Electromagnetic ultrasonic apparatus. 4,348,903, Cl. 73-643.000.
Sato, Masanori: *See*—
Amano, Kitsutaro; Nakai, Taiichiro; Sato, Masanori; and Nunokawa, Makoto, 4,349,243, Cl. 350-96.230.
Sato, Ryuichi: *See*—
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Sato, Shuichi: *See*—
Sato, Ichiya; Miyagawa, Kazuo; Sasaki, Yukito; Kawamura, Koji; Sato, Shuichi; Sasaki, Soji; Kubota, Jun; and Itoh, Susumu, 4,348,903, Cl. 73-643.000.
Sato, Yoshihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Strong magnetic field generator and method of operating the same. 4,349,853, Cl. 361-19.000.
Satoh, Ken, to Olympus Optical Co., Ltd. Tape tracking device. 4,349,849, Cl. 360-71.000.
Satoi, Shuzo: *See*—
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; and Hayashi, Mitsuo, 4,349,667, Cl. 536-13.900.
Savard, Hassel J., Jr., to Atron, Inc. Device for affixing garments onto hangers. 4,349,127, Cl. 221-196.000.
Sawada, Hiroomi: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,348,873, Cl. 62-514.00R.
Sawada, Kengi: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,348,873, Cl. 62-514.00R.
Sawano, Yukio, to Fuji Photo Film Co., Ltd. Apparatus for displaying information. 4,349,836, Cl. 358-93.000.
Sayegh, Antoine Y. Orthopaedic apparatus. 4,349,017, Cl. 128-92.00A.
Scavuzzo, Robert J., to Bell Telephone Laboratories, Incorporated. Emitter function logic flip-flop circuit. 4,349,753, Cl. 307-272.00A.
Schaffelhofer, Iwo: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Schaffelhofer, Iwo, 4,349,417, Cl. 203-33.000.
Schall, William R. Mold producing globe-shaped bells with single-piece shells. 4,349,065, Cl. 164-368.000.
Schattner, Allen S.: *See*—
Schattner, Robert L.; and Schattner, Allen S., 4,348,967, Cl. 109-51.000.
Schattner, Robert L.; and Schattner, Allen S., to Omnimed, Inc. Public security locker. 4,348,967, Cl. 109-51.000.
Scheinbeim, Jerry I.: *See*—
Pae, Kook D.; Newman, Brian A.; and Scheinbeim, Jerry I., 4,349,502, Cl. 264-320.000.
Scheiner, Harry, to Kings Electronics Co., Inc. Pi pad attenuator. 4,349,792, Cl. 333-81.00A.
Schell, Loni, to Hoechst Aktiengesellschaft. Process for preserving planographic printing forms. 4,349,391, Cl. 148-6.15R.
Schenk, Raymond L.: *See*—
Wirtz, John W.; and Schenk, Raymond L., 4,349,067, Cl. 164-479.000.
Schering Corporation: *See*—
Gold, Elijah H.; and Chang, Wei K., 4,349,472, Cl. 260-239.0BB.
Lee, Bong K.; Marquez, Joseph A.; and Waitz, J. Allan, 4,349,665, Cl. 536-7.100.
Schiffer, Henry. Simulated brick or tile. 4,349,588, Cl. 427-230.000.
Schildknecht, Richard J., to Research Products Corporation. Solar heating control. 4,349,012, Cl. 126-422.000.

Schilf, Lothar. Thermal insulation of vessels and method of fabrication. 4,349,051, Cl. 138-149.000.
Schirmer, Karl, to Mannesmann Demag Kunststofftechnik Zweigniederlassung der Mannesmann Demag Aktiengesellschaft. Non-return device at the screwhead of screw injection molding machines. 4,349,044, Cl. 137-512.300.
Schleiermacher, Herbert: *See*—
Nolte, Albert; Schleiermacher, Herbert; and Arbeiter, Erich, 4,348,990, Cl. 123-41.120.
Schleimer, Francois; Henrion, Romain; Goedert, Ferdinand; and Lorang, Lucien, to Arbed S.A. Process for refining of a bath of metal containing cold solid substances. 4,349,382, Cl. 75-60.000.
Schlueter, Francis E.: *See*—
Copley, Russell D.; and Schlueter, Francis E., 4,348,856, Cl. 56-30.000.
Schlumberger Technology Corporation: *See*—
Escaron, Pierre C.; and Hoppe, Joachim A., 4,349,072, Cl. 166-250.000.
Schmid, Frederick, to Crystal Systems Inc. Wire blades. 4,349,178, Cl. 254-216.000.
Schmid, Markus; and Gloor, Hans, to Concast AG. Method and apparatus for continuous casting of a number of strands. 4,349,066, Cl. 164-453.000.
Schmidli, Josef: *See*—
Arnold, Niklaus; Schmidli, Josef; and Spiess, Peter, 4,349,759, Cl. 310-233.000.
Schmidlin, Albertus E., to United States of America, Army. Artillery shell comprising two sections having complementary coupling members for connecting the sections together. 4,348,956, Cl. 102-377.000.
Schmidt, Helmut: *See*—
Blaser, Paul; Schmidt, Helmut; and Strobel, Walter, 4,349,286, Cl. 400-492.000.
Schmitt, Hermann: *See*—
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Schnarr, Marcus M.: *See*—
Fischbeck, Kenneth H.; Schnarr, Marcus M.; and Paraskevopoulos, Demetris F., 4,349,828, Cl. 346-1.100.
Schneider, David: *See*—
Davis, Paul; Weinstein, David; and Schneider, David, 4,349,571, Cl. 426-124.000.
Schneider, Franz; Schumann, Burkhard; Maier, Karl; and Hohn, Herbert, to L. Schuler GmbH. Unloading device for a press. 4,349,310, Cl. 414-749.000.
Schneider, Thomas G.: *See*—
Smith, Jay, III; Schneider, Thomas G.; and Grimm, Thomas H., 4,349,196, Cl. 273-1.0GC.
Schoening, Josef; Elter, Claus; and Schmitt, Hermann, to Hochtemperatur-Reaktorbau GmbH. Drive for an absorber rod of a nuclear reactor. 4,349,507, Cl. 376-230.000.
Schoennagel, Hans J., to Mobil Oil Corporation. Separately supported polymetallic reforming catalyst. 4,349,433, Cl. 208-139.000.
Schofield, John D., to Imperial Chemical Industries Limited. Dispersible inorganic pigment. 4,349,389, Cl. 106-308.00Q.
Schornack, Louis W.: *See*—
Goldstein, Richard; and Schornack, Louis W., 4,349,748, Cl. 307-132.00E.
Schreiner, Charles P., to Westinghouse Electric Corp. Wall-hung support rail. 4,349,113, Cl. 211-103.000.
Schrier, Eugene E.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,349,646, Cl. 525-256.000.
Schroeder, Verdell H.: *See*—
Robinson, Robert J.; Johnson, David B.; and Schroeder, Verdell H., 4,348,970, Cl. 112-256.000.
Schuhmacher, Werner, to Robert Bosch GmbH. Device for controlling a hydraulic power circuit. 4,348,945, Cl. 91-452.000.
Schulke, Karl A., to Heraeus Quarzschmelze GmbH. Flange connection to connect a metallic and a glass or ceramic structural element. 4,349,203, Cl. 277-26.000.
Schumacher, Gerd: *See*—
Lorenz, Hans-Walther; Schumacher, Gerd; and Kirchner, Helmut, 4,348,887, Cl. 73-23.000.
Schumaker, Jon S., to Pandrol Limited. Holding a railway rail down on a support member. 4,349,151, Cl. 238-349.000.
Schumann, Burkhard: *See*—
Schneider, Franz; Schumann, Burkhard; Maier, Karl; and Hohn, Herbert, 4,349,310, Cl. 414-749.000.
Schupack, Morris; and Suarez, Mario G. Electrically isolated reinforcing tendon assembly and method. 4,348,844, Cl. 52-230.000.
Schuster, Wilhelm; Stahl, Jurgen; and Wegner, Wilhelm, to AHK Alkohol Handelskontor GmbH. Valved, resilient-walled container for safely dispensing flammable liquids. 4,349,134, Cl. 222-212.000.
Schuurmans, Hubertus J. A.; and Peer, Andre T. M., to Shell Oil Company. Fluid treating column and apparatus for treating mixtures of liquid and gas. 4,349,360, Cl. 55-238.000.
Schwan, Thomas J.; Burch, Homer A.; and Gray, Joseph E., to Morton-Norwich Products, Inc. 3,4-Dihydro-3,4-isoquinolinedione 4-oxime. 4,349,677, Cl. 546-142.000.
Schwartz, Marvin P.: *See*—
Kim, Sung C.; and Schwartz, Marvin P., 4,348,794, Cl. 29-157.3AH.
Schwartz, Reinhard: *See*—
Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, 4,348,895, Cl. 73-119.00A.
Schween, Peter: *See*—
Krug, Gunter; Lahr, Helfried; Schween, Peter; and Wieczorek, Herbert, 4,349,465, Cl. 252-626.000.
Schwegler, Gunter: *See*—
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Schweizer, Heinz: *See*—
Muller, Helmut; and Schweizer, Heinz, 4,348,874, Cl. 464-162.000.
Schwerdhofer, Hans-Joachim, to Fichtel & Sachs AG. Chain shifting device. 4,349,342, Cl. 474-80.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Optically controlled integrated current diode lasers. 4,349,906, Cl. 372-50.000.
Scordato, Emil A.; and Pratt, Hugh W., to Medical Laboratory Automation, Inc. Disposable pipette tips and trays therefor. 4,349,109, Cl. 206-562.000.
Scott, David F., to FAD Company, Inc. Arrowhead with readily replaceable blades. 4,349,202, Cl. 273-422.000.
Scott, Ernest R.; and Bowers, William D., to Scott & Fetzer Company, The. Vacuum cleaner bag hanger assembly. 4,349,361, Cl. 55-357.000.
Scott & Fetzer Company, The: *See*—
Scott, Ernest R.; and Bowers, William D., 4,349,361, Cl. 55-357.000.
Scott, William H.: *See*—
Grant, Edward J., Jr.; Scott, William H.; and Stipanuk, John M., 4,349,758, Cl. 310-68.00A.
Scripto, Inc.: *See*—
Muller, Frank A., 4,349,639, Cl. 523-161.000.
Sebag, Henri: *See*—
Vanlerberghe, Guy; Sebag, Henri; and Zysman, Alexandre, 4,349,532, Cl. 424-47.000.
Segard, Emile-Pierre; and Lebeault, Jean-Michel, to Groupement d'Interet Economique Valpron. Process of treating the juice of squeezed vegetable material, such as lucerne, for producing alimentary proteins and super-nitrogenated protein foods, and products obtained by said process. 4,349,570, Cl. 426-52.000.
Seha, Zdenek, to Ciba-Geigy AG. Process for the carbazolation of anthrimides. 4,349,478, Cl. 260-316.000.
Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.
Seikosha Co., Ltd.: *See*—
Chida, Yoshinori; and Tada, Satoru, 4,349,287, Cl. 400-569.000.
Seiwa Kagaku Kabushiki Kaisha: *See*—
Nagoya, Takato, 4,348,833, Cl. 47-17.000.
Sejournant, Francine, to Antipol Commercial Systems (Jersey) Limited. Anti-adhesive composition based on wax in organic solvent medium. 4,349,586, Cl. 427-154.000.
Sekigawa, Keiji, to Ricoh Company, Ltd. Picture processing method. 4,349,846, Cl. 358-280.000.
Sekiguchi, Tomoyoshi; and Ishikawa, Hiroya, to Atsugi Motor Parts Co., Ltd. Electric control device for vehicle suspension system. 4,349,077, Cl. 180-41.000.
Selby, Jonathan W. Disposable cat relief chamber. 4,348,982, Cl. 119-1.000.
Selleck, George L. Non-saturable bun. 4,348,949, Cl. 99-426.000.
Selleri, Narciso: *See*—
Possati, Mario; Golinelli, Guido; and Selleri, Narciso, 4,348,814, Cl. 33-178.00E.
Senzaki, Takaya: *See*—
Tagami, Katsutoshi; Senzaki, Takaya; Suzuki, Nobuhiko; and Murao, Eiji, 4,349,823, Cl. 343-7.0VM.
Serebryakov, Edward P.: *See*—
Lischewski, Manfred; Adam, Habil G.; and Serebryakov, Edward P., 4,349,481, Cl. 549-297.000.
Serre, Hubert: *See*—
D'Hinterland, Lucien D.; Serre, Hubert; and Normier, Gerard, 4,349,540, Cl. 424-92.000.
Sevylor: *See*—
Leber, Edmond, 4,348,779, Cl. 114-345.000.
SFS Stadler AG: *See*—
Bogel, Gerhard, 4,349,106, Cl. 206-347.000.
Shackle, Peter W.: *See*—
Hartman, Adrian R.; and Shackle, Peter W., 4,349,751, Cl. 307-252.00A.
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce R., to UMC Industries, Inc. Paper currency device. 4,349,111, Cl. 209-534.000.
Shamsha, Ljudmila F.: *See*—
Efimov, Vyacheslav T.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; Shamsha, Ljudmila F.; and Axenko, Alexandr A., 4,349,430, Cl. 204-302.000.
Shapiro, Stanley J.: *See*—
Campillo, Anthony J.; Hyer, Ronald C.; and Shapiro, Stanley J., 4,349,907, Cl. 372-92.000.
Sharp Kabushiki Kaisha: *See*—
Mariyama, Ryoiti, 4,349,715, Cl. 219-10.55B.
Sharpe, Derrick, to W. H. D. Development Limited. Containers. 4,349,108, Cl. 206-506.000.
Shaw, Pern; and Musa, Fuad H., to Motorola, Inc. Microcomputer with programmable multi-function port. 4,349,870, Cl. 364-200.000.
Shedrow, Sidney. Adjustable eyeglass mounting. 4,349,251, Cl. 351-128.000.

Shell Oil Company: *See*—
Powell, James E.; and Sanborn, James R., 4,349,676, Cl. 546-141.000.
Prett, David M.; Ramaker, Brian L.; and Cutler, Charles R., 4,349,869, Cl. 364-159.000.
Schuurmans, Hubertus J. A.; and Peer, Andre T. M., 4,349,360, Cl. 55-238.000.
Sheltered Workshop for the Disabled, Inc.: *See*—
Blackington, Paul A., 4,349,497, Cl. 264-1.500.
Sheridan, John J. Air dispersing head for air heaters. 4,349,725, Cl. 219-373.000.
Sherman, William E. Attachment and method for grinding and filing chain saw bars. 4,348,919, Cl. 76-112.000.
Sherry, Howard S.: *See*—
Dent, Anthony L.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,349,533, Cl. 424-52.000.
Shibata, Yumi: *See*—
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,349,647, Cl. 525-285.000.
Shibayama, Hikou; Ogawa, Tetsuya; Kosugi, Makoto; Hisatsugu, Tokushige; and Kobayashi, Koichi, to Fujitsu Limited. Method and apparatus for plasma etching. 4,349,409, Cl. 156-643.000.
Shibukawa, Mitsuru: *See*—
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,349,627, Cl. 435-108.000.
Shimada, Junichi; and Ogawa, Kazutake, to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.). Mounting for a heat producing element of an automobile. 4,349,078, Cl. 180-69.100.
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, to Nissan Motor Co., Ltd. Push-button type valve. 4,349,177, Cl. 251-230.000.
Shimamune, Takayuki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,349,581, Cl. 427-34.000.
Shimane, Koichi: *See*—
Horiguchi, Satoru; Sasaoka, Takeshi; and Shimane, Koichi, 4,349,835, Cl. 358-76.000.
Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,348,916, Cl. 74-489.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Brake operating device for a bicycle. 4,348,916, Cl. 74-489.000.
Shimanuki, Masanobu: *See*—
Ishii, Shoichi; Hagiwara, Taiken; and Shimanuki, Masanobu, 4,349,848, Cl. 360-66.000.
Shimizu, Jozo; Yamaguchi, Satoru; and Aoyama, Shigeo, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,349,608, Cl. 428-413.000.
Shimizu, Kunio. Fluid shut-off device. 4,349,042, Cl. 137-39.000.
Shimotsuma, Wataru: *See*—
Kishimoto, Yoshio; and Shimotsuma, Wataru, 4,349,606, Cl. 428-411.000.
Shimoya, Shigeo, to Kobishi Electric Co., Ltd. Magnetic proximity switch. 4,349,800, Cl. 335-207.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Toyoshima, Shigeshi; Sato, Ryuichi; Ito, Koichi; Shinohara, Toshio; and Yamamoto, Yasushi, 4,349,682, Cl. 548-110.000.
Shinkai, Ichiro: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,349,687, Cl. 549-291.000.
Shinoda, Masaichi: *See*—
Toyokura, Nobuo; Tokunaga, Hiroshi; Inoue, Shinichi; Ishikawa, Hajime; and Shinoda, Masaichi, 4,349,395, Cl. 148-187.000.
Shinohara, Toshio: *See*—
Toyoshima, Shigeshi; Sato, Ryuichi; Ito, Koichi; Shinohara, Toshio; and Yamamoto, Yasushi, 4,349,682, Cl. 548-110.000.
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., to Kennecott Corporation. Method for brazing a surface of an age hardened chrome copper member. 4,349,145, Cl. 228-208.000.
Shinozaki, Junichiro: *See*—
Komatsu, Fumito; and Shinozaki, Junichiro, 4,349,899, Cl. 368-75.000.
Shiomi, Teiichi: *See*—
Kameyama, Masao; and Shiomi, Teiichi, 4,349,603, Cl. 428-334.000.
Shiozaki, Ted M. Animal waste collecting and disposing apparatus. 4,349,224, Cl. 294-1.0BA.
Shirato, Takehide, to Fijitsu Limited. Process for producing a semiconductor device. 4,348,802, Cl. 29-571.000.
Shmitka, Clarence F. Antenna assembly for high frequency ranges. 4,349,825, Cl. 343-750.000.
Shoh, Andrew, to Branson Ultrasonics Corporation. Power measuring arrangement for vibratory welder. 4,348,908, Cl. 73-862.540.
Shoham, Dan. Method of putting in a partition of insulation material inside concrete walls which are cast in a vertical position in an industrial building site. 4,349,492, Cl. 264-35.000.
Shook, George L.: *See*—
Stickler, John M.; and Shook, George L., 4,348,891, Cl. 73-81.000.
Shore, Sheldon G.; and Nagel, Colleen C., to Ohio State University Research Foundation, The. Ruthenium carbonylates, ruthenium carbonyl hydrides, osmium carbonylates and their preparation. 4,349,521, Cl. 423-417.000.
Shore, Sheldon G.; and Plotkin, Jeffrey S., to Ohio State University Research Foundation, The. Iron, nickel and cobalt tri-osmium carbonyl hydrides and their preparation. 4,349,522, Cl. 423-417.000.
Showman, Robert L.; and Yeager, Patrick F., to AMP Incorporated. Integrated circuit package connector. 4,349,238, Cl. 339-75.00M.
Shulzhenko, Alexandr A.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.
SI Handling Systems, Inc.: *See*—
Brown, William L., 4,349,126, Cl. 221-112.000.
Rohrbach, Peter H., 4,348,961, Cl. 104-252.000.
Siemens Aktiengesellschaft: *See*—
Diepers, Heinrich, 4,349,760, Cl. 310-248.000.
Grassmann, Peter; Dietz, Kurt; and Meinel, Friedrich, 4,349,740, Cl. 378-25.000.
Hinrichs, Fritz, 4,349,693, Cl. 174-52.0PE.
Pfleiderer, Hans-Joerg; and Klar, Heiner, 4,349,749, Cl. 307-221.00D.
Siemens Corporation: *See*—
Wei, Lawrence S., 4,349,394, Cl. 148-175.000.
Sifniades, Stylianos: *See*—
Bonfield, John H.; Sifniades, Stylianos; and Ulmer, Harry E., 4,349,520, Cl. 423-387.000.
Silvey, E. Ray. Hydraulic safety hose. 4,349,049, Cl. 138-103.000.
Simm, Hans-Peter; Guhne, Wieland; and Hoffmann, Klaus, to Vorwerk & Co. Interholding GmbH. Sealing arrangement for tubular elements of floor care device. 4,349,206, Cl. 277-207.00R.
Sims, Loyie, to Sims Oil, Inc. Oil refiner. 4,349,438, Cl. 210-180.000.
Sims Oil, Inc.: *See*—
Sims, Loyie, 4,349,438, Cl. 210-180.000.
Singer Company, The: *See*—
Whitby, Clyde M.; and White, Douglas L., deceased, 4,349,732, Cl. 250-201.000.
Singer, Wayne J., to Kimberly-Clark Corporation. Surgical leggings. 4,349,019, Cl. 128-132.00D.
Skabla, Joseph. Sound reproduction system. 4,349,697, Cl. 179-1.00D.
SKF Industrial Trading & Development Co. B.V.: *See*—
Nutzel, Hans G.; and Kuhl, Rudolf, 4,349,423, Cl. 204-146.000.
Skoog, Karl I. L., to Telefonaktiebolaget L M Ericsson. Method and apparatus for reducing the demand on the number of transferred bits when transferring PCM information. 4,349,913, Cl. 375-25.000.
Sletzinger, Meyer: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,349,687, Cl. 549-291.000.
Slivenko, Victor: *See*—
Ellis, Willard H.; Haubold, Axel D.; Slivenko, Victor; and Bokros, Jack C., 4,349,498, Cl. 264-81.000.
Slootz, Josef: *See*—
Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, 4,349,718, Cl. 219-78.010.
Small, Rudolph E.; and Spalding, Michael H., to Paper Converting Machine Company. Folding apparatus. 4,349,185, Cl. 270-32.000.
Smallegan, Jon M., to Multifastener Corporation. Nut installation apparatus and method. 4,348,796, Cl. 29-432.000.
Smiesko, Frank A.: *See*—
Beiswenger, John L.; and Smiesko, Frank A., 4,349,157, Cl. 239-509.000.
Smirnov, Vladimir N.: *See*—
Maximenko, Alexandr V.; Torchilin, Vladimir P.; Smirnov, Vladimir N.; and Chazov, Evgeny I., 4,349,630, Cl. 435-180.000.
Smith Engineering: *See*—
Smith, Jay, III; Schneider, Thomas G.; and Grimm, Thomas H., 4,349,196, Cl. 273-1.0GC.
Smith, James D. B., to Westinghouse Electric Corp. Resinous copolymer insulating compositions. 4,349,651, Cl. 526-263.000.
Smith, Jay, III; Schneider, Thomas G.; and Grimm, Thomas H., to Smith Engineering. Computer control toy track system. 4,349,196, Cl. 273-1.0GC.
Smith and Nephew Associated Companies Limited: *See*—
Gilbert, David J.; and Hollingsbee, Derek A., 4,349,563, Cl. 424-274.000.
Smith, Philip S., to Motorola, Inc. CMOS Static ALU. 4,349,888, Cl. 364-716.000.
Smith, Phillip H. Lighted plant stand. 4,349,864, Cl. 362-122.000.
Smith, Roger L.; and Murphy, Robert P., to Standard Oil Company (Indiana). Determination of movable oil saturations. 4,349,737, Cl. 250-259.000.
Smith, Stephen W., to Trinity Industries, Inc. Railway hopper car bolster assembly. 4,348,962, Cl. 105-248.000.
Smith, William E.: *See*—
Brunelle, Daniel J.; and Smith, William E., 4,349,486, Cl. 260-463.000.
Smith, William F.: *See*—
Thomas, Joseph J.; Vaillancourt, Vincent L.; Millet, Marcus J.; and Smith, William F., 4,349,035, Cl. 128-766.000.
Snaidr, Stanislav M.: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,349,037, Cl. 131-306.000.
Snee, Timothy J., to National Research Development Corporation. Explosimeter. 4,348,888, Cl. 73-23.000.
SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A: *See*—
Rossi, Pier P.; and Catoni, Mario, 4,349,473, Cl. 260-239.30A.
Snijders, Wilfred A. M.: *See*—
van den Elzen, Hendricus C.; Van Gerwen, Petrus J.; Snijders, Wilfred A. M.; and Verhoeckx, Nicolaas A. M., 4,349,889, Cl. 364-724.000.
Snopko, Paul A., to Zenith Radio Corporation. Television receiver with two-way telephone conversation and dial-out capabilities. 4,349,701, Cl. 179-2.0TV.

Snyder, Robert S.: *See*—
Rhodes, Percy H.; and Snyder, Robert S., 4,349,429, Cl. 204-299.00R.

Snyder, Wesley L. Laser-aiming system with means for electrical arc suppression. 4,348,828, Cl. 42-1.00A.

Snyder, William V.: *See*—
Lord, Tom J.; and Snyder, William V., 4,348,799, Cl. 29-450.000.

Sobel, Johannes; Himmelmann, Wolfgang; and Bergthaller, Peter, to Agfa-Gevaert Aktiengesellschaft. Photographic silver halide material. 4,349,624, Cl. 430-622.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Raboud, Pierre-Benoit; Kubicek, Frantisek; and Bandi, Jean-Pierre, 4,349,579, Cl. 426-631.000.

Societe Europeene de Propulsion: *See*—
Donguy, Paul, 4,349,155, Cl. 239-265.330.

Societe Francaise d'Equipements pour la Navigation Aerienne: *See*—
Willoteaux, Guy, 4,349,769, Cl. 318-677.000.

Soeno, Ko: *See*—
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Misumi, Akira; and Fukushima, Hiroshi, 4,349,766, Cl. 313-346.00R.

Sohio: *See*—
Li, George S.; and Jones, John F., 4,349,652, Cl. 526-271.000.
Velenyi, Louis J.; and Dolhyj, Serge R., 4,349,462, Cl. 252-455.00R.

Sokolov, Alexandr N.: *See*—
Lysanov, Vladislav S.; Digonsky, Viktor V.; Feldgun, Leon I.; Davidenko, Valery M.; Novikov, Nikolai V.; Borimsky, Alexandr I.; Shulzhenko, Alexandr A.; Yakimenko, Valerian D.; Dovgal, Eduard Y.; Egorov, Vitaly Y.; Rovsha, Vyacheslav S.; Prikhna, Alexei I.; and Sokolov, Alexandr N., 4,349,517, Cl. 423-290.000.

Solar Kinetics, Inc.: *See*—
Hutchison, Joseph A., 4,348,797, Cl. 29-434.000.
Hutchison, Joseph A., 4,348,798, Cl. 29-448.000.

Solarex Corporation: *See*—
Lindmayer, Joseph, 4,349,691, Cl. 136-261.000.

Solbern Corp.: *See*—
Eisenberg, Bernard C., 4,349,053, Cl. 141-1.000.

Solex Research Corporation: *See*—
Watanabe, Morio; and Nishimura, Sanji, 4,349,514, Cl. 423-54.000.

Somar Manufacturing Co., Ltd.: *See*—
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,349,647, Cl. 525-285.000.

Sondermeyer, Jack C., to Peavey Electronics Corp. Transient intermodulation distortion limiting circuit for an amplifier system. 4,349,788, Cl. 330-293.000.

Sonneborn, Walter G. O.: *See*—
Hughes, Charles W.; Harvey, Keith W.; and Sonneborn, Walter G. O., 4,349,316, Cl. 416-104.000.

Sony Corporation: *See*—
Kitamura, Tomosaburo; Miyahara, Kosuke; and Kodera, Yoichi, 4,349,762, Cl. 310-332.000.
Muramoto, Shoichi; Tsukamura, Yoshihiro; Tozawa, Masayuki; and Ishii, Fusao, 4,349,767, Cl. 313-449.000.
Ohsawa, Mitsuo, 4,349,860, Cl. 361-310.000.

Soter, Richard A., III. Electric rug binding system. 4,349,142, Cl. 227-13.000.

South Eastern Electricity Board: *See*—
Peddie, Robert A.; and Fielden, John S., 4,349,879, Cl. 364-492.000.

Southard, Edward S. Engine block heater. 4,348,992, Cl. 123-142.50R.

Southgate, Peter D.; and Beltz, John P., to RCA Corporation. Inspection system for detecting defects in regular patterns. 4,349,880, Cl. 364-507.000.

Southport Enterprises, Inc.: *See*—
Churchill, John W., 4,349,727, Cl. 219-544.000.

Sovey, James S.; Forman, Ralph; Curren, Arthur N.; and Wintucky, Edwin G., to United States of America, National Aeronautics and Space Administration. Ion sputter textured graphite. 4,349,424, Cl. 204-192.00E.

Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Non-vitreous ceramic metal oxide microcapsules and process for making same. 4,349,456, Cl. 252-317.000.

Spadafora, Leonard: *See*—
Onksen, Peter J.; and Spadafora, Leonard, 4,349,281, Cl. 374-136.000.

Spalding, Michael H.: *See*—
Small, Rudolph E.; and Spalding, Michael H., 4,349,185, Cl. 270-32.000.

Spar Aerospace Limited: *See*—
Hinds, Charles M., 4,349,837, Cl. 358-93.000.

Spector, George: *See*—
Harris, Albert; and Spector, George, 4,348,922, Cl. 81-180.00R.
Knapp, Frank H.; and Spector, George, 4,348,823, Cl. 36-123.000.

Spector, Nancy R. Burglar proof bolt. 4,349,223, Cl. 292-259.00R.

Spence, Gavin G.: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,349,641, Cl. 524-458.000.

Spiess, Georg: *See*—
Weyrich, Klaus, 4,349,187, Cl. 271-159.000.

Spiess, Peter: *See*—
Arnold, Niklaus; Schmidli, Josef; and Spiess, Peter, 4,349,759, Cl. 310-233.000.

Spill-Fire Alarm Systems Ltd.: *See*—
Norfolk, Raymond W., 4,349,282, Cl. 374-183.000.

Spinner, Georg. Adjustable directional coupler having tiltable coupling conductor. 4,349,793, Cl. 333-111.000.

Spiteri, Jean-Claude: *See*—
Perrigault, Claude; and Spiteri, Jean-Claude, 4,349,707, Cl. 179-175.31R.

Spooner, Archer M., to Redifon Simulation Limited. Head-movable frame-scanner for head-coupled display. 4,349,815, Cl. 340-705.000.

Sprague, Allison A.: *See*—
Rowley, Edward K.; and Sprague, Allison A., 4,348,955, Cl. 102-317.000.

Spraying Systems Company: *See*—
Haruch, James; and Williams, Robert, 4,349,156, Cl. 239-432.000.

Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for enhancing or augmenting the aroma of detergents using norbornyl esters. 4,349,449, Cl. 252-174.110.

Square D Company: *See*—
Carroll, James C.; and Chapman, Donald L., 4,349,220, Cl. 285-121.000.

Staerzl, Richard E., to Brunswick Corporation. Control means for fuel injection in an internal combustion engine. 4,349,000, Cl. 123-491.000.

Stahl, Jurgen: *See*—
Schuster, Wilhelm; Stahl, Jurgen; and Wegner, Wilhelm, 4,349,134, Cl. 222-212.000.

Stahle, Martin. Cooling a motor of a centrifugal pump for conveying liquids with deposited solids. 4,349,322, Cl. 417-370.000.

Staiert, Richard W.: *See*—
DePauw, Richard A.; and Staiert, Richard W., 4,348,855, Cl. 56-10.200.

Stalter, Joseph F.; and Felten, Gilbert A., to Goodyear Tire & Rubber Company, The. Tire building machine drum. 4,349,406, Cl. 156-416.000.

Stan, Aurel V., to Goodyear Tire & Rubber Company, The. Direct reading temperature and circumferential tire monitor. 4,348,898, Cl. 374-124.000.

Standard Oil Company, The: *See*—
Li, George S.; and Jones, John F., 4,349,653, Cl. 526-272.000.

Standard Oil Company (Indiana): *See*—
Smith, Roger L.; and Murphy, Robert P., 4,349,737, Cl. 250-259.000.

Standard Products Company, The: *See*—
Nussbaum, Joel H., 4,349,592, Cl. 428-31.000.

Stang, John H.; Ruthmansdorfer, David A.; and Reichenbach, Dean H., to Cummins Engine Company, Inc. Dual coolant engine cooling system. 4,348,991, Cl. 123-41.290.

Staniforth, John N., to National Research Development Corporation. Mixture containing active ingredient and dendritic crystalline sugar for tableting. 4,349,542, Cl. 424-153.000.

Stanley Aviation Corporation: *See*—
Russell, George K., 4,349,357, Cl. 55-21.000.

Stanley, Philip E.: *See*—
Woods, William E.; Stanley, Philip E.; Cushing, David E.; and Lemay, Richard A., 4,349,874, Cl. 364-200.000.

Starp, Franz. Photographic camera such as a reflex camera. 4,349,256, Cl. 354-43.000.

Staurseth, Erik, to Westamarin A/S. Aerial cableway between a sea vessel and a fixed installation. 4,348,960, Cl. 104-114.000.

Steele, Douglas S., to General Electric Company. Optical triangulation apparatus and method. 4,349,274, Cl. 356-1.000.

Steele, Duane C., to Hooker Chemicals & Plastics Corp. Low temperature low foaming alkaline cleaner and method. 4,349,448, Cl. 252-135.000.

Steeman, Peter K. R. M.; and Vervecken, Karel R., to U.S. Philips Corporation. Low-pressure metal vapor discharge lamp. 4,349,764, Cl. 313-176.000.

Stefanucci, Arthur; and Protomastro, Michael G., to General Foods Corporation. Low density coffee process. 4,349,573, Cl. 426-388.000.

Stein, John C.; and Hutchison, Donald W., to Essex Group, Inc. Temperature probe for air conditioning device. 4,348,870, Cl. 62-140.000.

Stelck, Larry W. String for sporting goods. 4,349,198, Cl. 273-73.00D.

Stenberg, Erik G., to AB Karlstads Mekaniska Werkstad. Method for forming a multilayer jet of paper making stock. 4,349,414, Cl. 162-123.000.

Stephanoff, Louis J.; and Avramidis, Stellios A., to PT Components, Inc. Chain for variable speed transmission. 4,349,343, Cl. 474-245.000.

Steplewski, Zenon: *See*—
Koprowski, Hilary; Mitchell, Kenneth F.; and Steplewski, Zenon, 4,349,528, Cl. 424-1.000.

Sterling Drug Inc.: *See*—
Bell, Malcolm R., 4,349,558, Cl. 424-273.00P.
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,349,559, Cl. 424-273.00P.

Sterling, Henley F.; and Drake, Miles P., to International Standard Electric Corporation. Plasma deposition of glass or its precursor. 4,349,373, Cl. 65-60.800.

Steude, Heinrich: *See*—
Brandt, Hans-Walter; Steude, Heinrich; Bruns, Ludwig; and Kohler, Hans-Dieter, 4,349,416, Cl. 203-19.000.

Stevenson, Christopher T. S.; and D'Aloisio, Elio F., to Litton Industrial Products, Inc. Friction welding machine with dual position end stop. 4,349,144, Cl. 228-2.000.

Stewart, Donald L., Jr., to Aluminum Company of America. Fractional distillation process for the production of aluminum chloride. 4,349,420, Cl. 203-75.000.

Stewart-Warner Corporation: *See*—
Fontana, Frank J., 4,348,784, Cl. 16-36.000.

Stich, Werner: *See*—
Kluth, Manfred; Antoni, Heinz; and Stich, Werner, 4,348,909, Cl. 73-863.210.

Stickler, John M.; and Shook, George L., to B F Goodrich Company, The. Tire hardness tester. 4,348,891, Cl. 73-81.000.

Stieger, Karl, to BBC Brown, Boveri & Company, Ltd. Apparatus for the controlled extraction of steam from extraction turbines. 4,349,312, Cl. 415-145.000.

Stipanuk, John M.: *See*—
Grant, Edward J., Jr.; Scott, William H.; and Stipanuk, John M., 4,349,758, Cl. 310-68.00A.

Stirling, William L., to United States of America, Energy. Neutral beamline with ion energy recovery based on magnetic blocking of electrons. 4,349,505, Cl. 376-130.000.

Stockler, Jerry R.: *See*—
Blumenthal, Michael M.; and Stockler, Jerry R., 4,349,353, Cl. 23-230.00R.

Stogis, James: *See*—
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,349,662, Cl. 528-301.000.

Stoll, Brigitte: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,349,684, Cl. 548-320.000.
Lautenschlager, Hans-Heiner; Betzing, Hans; Winkelmann, Johannes; Probst, Manfred; and Stoll, Brigitte, 4,349,686, Cl. 549-69.000.

Stoll, Kurt. Pressure-medium connection between a valve block and a load which has at least one double-acting pressure-medium motor. 4,348,942, Cl. 91-54.000.

Stoneleigh Trust, The: *See*—
Massa, Frank, 4,348,869, Cl. 62-140.000.

Stormer, Horst L.: *See*—
Chin, Maurice A.; Narayanamurti, Venkatesh; and Stormer, Horst L., 4,349,796, Cl. 333-186.000.

Strader, Charles J.; and Walle, Richard V., to Eltra Corporation. Modular hazardous dust collection pan and walkway. 4,348,840, Cl. 52-180.000.

Straubel, Max; Schwartz, Reinhard; Ritter, Ernst; Djordjevic, Ilija; and Doll, Reinhard, to Robert Bosch GmbH. Method for angularly correct mounting of a fuel injection pump on an internal combustion engine. 4,348,895, Cl. 73-119.00A.

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Streaty, Charles E., Jr.: *See*—
Lehnhardt, William F.; Streaty, Charles E., Jr.; Yackel, Walter C., Jr.; Yang, Ho S.; and Tang, Daniel K., 4,349,576, Cl. 426-582.000.

Streifer, William: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,349,906, Cl. 372-50.000.

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Blaser, Paul; Schmidt, Helmut; and Strobel, Walter, 4,349,286, Cl. 400-492.000.

Strongwater, Murray. Packaging device. 4,349,102, Cl. 206-45.340.

Stuber, Fred A.: *See*—
Barsa, Edward A.; Lin, Chung-Yuan; and Stuber, Fred A., 4,349,663, Cl. 528-367.000.

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Cashwell, Ernest; Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,349,719, Cl. 219-121.0LK.

Stumpp, Gerhard, to Robert Bosch GmbH. Fuel injection pump. 4,348,998, Cl. 123-447.000.

Stupp, Edward H.; and Lalak, Joseph, to North American Philips Corporation. Method of manufacturing a pyroelectric vidicon target, apparatus for practicing the method, and a pyroelectric target manufactured by the method. 4,349,410, Cl. 156-654.000.

Sturges, Robert H., Jr.: *See*—
Wilks, Robert S.; Taleff, Alexander; and Sturges, Robert H., Jr., 4,349,112, Cl. 209-538.000.

Sturm, Elmar: *See*—
Buhler, Niklaus; Baumann, Marcus; Bellus, Daniel; and Sturm, Elmar, 4,349,564, Cl. 424-274.000.

Sturm, Werner, to Von Roll A.G. Welding muff of thermoplastic material. 4,349,219, Cl. 285-21.000.

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Schupack, Morris; and Suarez, Mario G., 4,348,844, Cl. 52-230.000.

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Sugawara, Yutaka: *See*—
Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, 4,349,541, Cl. 424-95.000.

Sugihara, Kunihiko: *See*—
Nishimura, Toshifumi; and Sugihara, Kunihiko, 4,348,905, Cl. 73-654.000.

Sugimoto, Hiroaki: *See*—
Kato, Yasuyuki; Sugimoto, Hiroaki; and Hanabata, Makoto, 4,349,659, Cl. 528-193.000.

Sumida, Atsushi: *See*—
Hiramatsu, Toru; Koseki, Teruo; Hamada, Satosi; and Sumida, Atsushi, 4,349,523, Cl. 423-447.400.

Sumitomo Chemical Company, Limited: *See*—
Horide, Fumio; Tsuji, Kozo; and Yoshida, Ryo, 4,349,379, Cl. 71-120.000.
Kato, Yasuyuki; Sugimoto, Hiroaki; and Hanabata, Makoto, 4,349,659, Cl. 528-193.000.
Nakatsuka, Kiyoharu; and Abeta, Sadaharu, 4,349,349, Cl. 8-527.000.
Ohmae, Tadayuki; Murakami, Teruhiko; and Kanno, Yoshinori, 4,349,654, Cl. 526-273.000.
Uematsu, Tamon; Inoue, Satoru; and Yamashita, Norihisa, 4,349,554, Cl. 424-258.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Tanaka, Itsuo; and Tanaka, Hiromi, 4,349,362, Cl. 55-390.000.

Sunbeam Corporation: *See*—
Grant, Edward J., Jr.; Scott, William H.; and Stipanuk, John M., 4,349,758, Cl. 310-68.00A.

Superflexit Limited: *See*—
Kirby, Roy J., 4,349,221, Cl. 285-149.000.

Superior Casing Crews, Inc.: *See*—
Clark, Jim W., 4,349,048, Cl. 138-96.00T.

Sussex Instruments Limited: *See*—
Haynes, Anthony C.; and Unwin, Derek K., 4,348,889, Cl. 73-37.700.

Sussman, Richard: *See*—
Everett, Nicholas W., 4,349,137, Cl. 223-73.000.

Suur-Askola, Seppo: *See*—
Torenius, Pekka; and Suur-Askola, Seppo, 4,349,858, Cl. 361-181.000.

Suzuki, Jitsuo: *See*—
Naito, Junichiro; Yamamoto, Shinichi; Suzuki, Jitsuo; and Asano, Mitsuru, 4,349,329, Cl. 425-461.000.

Suzuki, Naoyoshi: *See*—
Shimada, Yukio; Suzuki, Naoyoshi; Ohashi, Toshio; and Inoshita, Yasushi, 4,349,177, Cl. 251-230.000.

Suzuki, Nobuhiko: *See*—
Tagami, Katsutoshi; Senzaki, Takaya; Suzuki, Nobuhiko; and Murao, Eiji, 4,349,823, Cl. 343-7.0VM.

Suzuki, Ryo; Uehara, Keiichi; Takeuchi, Teruaki; and Takeshita, Masatoshi, to Hitachi, Ltd. Magnetic bubble detector. 4,349,892, Cl. 365-8.000.

Suzuki, Yoshio: *See*—
Kikuchi, Michitsugu; and Suzuki, Yoshio, 4,349,063, Cl. 152-359.000.

Svoboda, Josef, to TMC Corporation. Holding plate, in particular for ski bindings. 4,349,212, Cl. 280-610.000.

Swanson, Albert S.; and Geyer, Robert A., to Tennant Company. Scrubbing machine with selective recycle. 4,348,783, Cl. 15-320.000.

Swanson, Richard H., to Kelvinator Commercial Products, Inc. Cantilevered shelf construction. 4,348,965, Cl. 108-152.000.

Sweetheart Plastics, Inc.: *See*—
Davis, Paul; Weinstein, David; and Schneider, David, 4,349,571, Cl. 426-124.000.

Swiatosz, Edmund, to United States of America, Navy. Electrically heated non-toxic smoke generator. 4,349,723, Cl. 219-271.000.

Swiss Aluminium Ltd.: *See*—
Gut, Edwin; Arnold, Erwin; Maugweiler, Gottfried; and Friedli, Hans, 4,349,231, Cl. 299-69.000.

Syntex (U.S.A.) Inc.: *See*—
Roszkowski, Adolph P.; Clark, Robin D.; and Kluge, Arthur F., 4,349,549, Cl. 424-248.550.

Synthelabo: *See*—
Bigg, Dennis, 4,349,557, Cl. 424-270.000.
Bigg, Dennis C., 4,349,683, Cl. 548-183.000.

Systems, Science and Software: *See*—
Day, Edward A., 4,348,958, Cl. 102-499.000.

Tabata, Hideo: *See*—
Hoshi, Hideo; Mitsugi, Shiro; Teruyama, Hiroichi; and Tabata, Hideo, 4,349,763, Cl. 310-370.000.

Tabata, Junichi: *See*—
Kaneko, Noboru; and Tabata, Junichi, 4,349,818, Cl. 340-785.000.

Tabet Manufacturing Company: *See*—
Tabet, Michael A., 4,349,857, Cl. 361-173.000.

Tabet, Michael A., to Tabet Manufacturing Company. Light responsive control device. 4,349,857, Cl. 361-173.000.

Tabuchi, Kenji: *See*—
Wada, Kenichi; Tanaka, Susumu; and Tabuchi, Kenji, 4,349,270, Cl. 355-15.000.

Tacchella, Elio, to Tacchella Macchine S.p.A. Broach sharpening machine. 4,348,838, Cl. 51-34.00C.

Tacchella Macchine S.p.A.: *See*—
Tacchella, Elio, 4,348,838, Cl. 51-34.00C.

Tachita, Ryobun; Hayakawa, Yoshihiro; Irioka, Kazuyoshi; Fukukita, Hiroshi; Yano, Tsutomu; and Fukumoto, Akira, to Matsushita Electric Industrial Company, Limited. Ultrasonic imaging system using plural square wave pulse trains of successively delayed intervals. 4,348,902, Cl. 73-626.000.

Tacon, William C. A.: *See*—
Carey, Norman H.; Emtage, John S.; Tacon, William C. A.; and Hallewell, Robert A., 4,349,629, Cl. 435-172.000.

Tada, Masahiro, to Nippon Electric Co., Ltd. Buffer storage control apparatus. 4,349,875, Cl. 364-200.000.

Tada, Satoru: *See*—
Chida, Yoshinori; and Tada, Satoru, 4,349,287, Cl. 400-569.000.

Tagami, Katsutoshi; Senzaki, Takaya; Suzuki, Nobuhiko; and Murao, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Automotive radar monitor system. 4,349,823, Cl. 343-7.0VM.

Taguchi, Noboru: *See*—
Hara, Hiroo; and Taguchi, Noboru, 4,349,908, Cl. 372-103.000.

Takahashi, Fumitaka; and Gotoh, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Angular velocity sensor. 4,348,900, Cl. 73-505.000.

Takahashi, Kenji: *See—*
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.

Takahashi, Kyoichi: *See—*
Tonomura, Kenichi; Takahashi, Kyoichi; and Furihata, Makoto, 4,349,834, Cl. 358-27.000.

Takahashi, Yasuyuki: *See—*
Mimura, Akio; Takahashi, Yasuyuki; Yuasa, Katsumi; and Shibukawa, Mitsuru, 4,349,627, Cl. 435-108.000.

Takahata, Kazunori; Taniguchi, Katsuo; and Fujimoto, Tadaaki, to Mitsui Petrochemical Industries Ltd. Process for separation of alkyl phenols by azeotropic distillation. 4,349,419, Cl. 203-70.000.

Takamatsu, Takeshi, to Olympus Optical Co., Ltd. Endoscope system. 4,349,014, Cl. 128-6.000.

Takami, Akio: *See—*
Nagashima, Teruyoshi; Takami, Akio; and Kasugai, Akiyo, 4,349,585, Cl. 427-125.000.

Takasaki, Masaru; and Imatomi, Keiichiro, to Nissan Motor Co., Ltd. Pneumatic duct connection. 4,349,222, Cl. 285-363.000.

Takaya, Takao; and Tozuka, Zenzaburo, to Fujisawa Pharmaceutical Company, Ltd. 5-Fluorouracil derivatives, and their pharmaceutical compositions. 4,349,552, Cl. 424-251.000.

Takayama, Syuichi, to Olympus Optical Co., Ltd. Photographing apparatus for an endoscope. 4,349,255, Cl. 354-31.000.

Takazawa, Yuzuru: *See—*
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.

Takechi, Keiji: *See—*
Maeda, Keisuke; Takechi, Keiji; and Oya, Tetsuro, 4,349,266, Cl. 354-295.000.

Takeda Chemical Industries, Ltd.: *See—*
Meguro, Kanji; Tawada, Hiroyuki; and Matsuo, Takao, 4,349,547, Cl. 424-244.000.

Takeda, Keiji: *See—*
Kawashiri, Kazuhiro; Mizobuchi, Yuzo; Higashi, Akio; Tamura, Hiroshi; Takeda, Keiji; and Nagata, Masayoshi, 4,349,617, Cl. 430-59.000.

Takeda, Keiso; Inouye, Shozo; and Kashiwakura, Toshimi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection type carburetor. 4,348,997, Cl. 123-445.000.

Takeda, Motoaki: *See—*
Yamamura, Nobuo; and Takeda, Motoaki, 4,349,455, Cl. 252-312.000.

Takeda Riken Kogyo Kabushikikaisha: *See—*
Kurihara, Takenori, 4,349,789, Cl. 331-4.000.
Mitamura, Masakazu, 4,349,777, Cl. 323-226.000.

Takeda, Shiro; and Nakajima, Minoru, to Fujitsu Limited. Electronic device having multilayer wiring structure. 4,349,609, Cl. 428-429.000.

Takeda, Yasuhisa; Matsuno, Takashi; Ohtaka, Mihoko; Mitsui, Hiroki; Kawaguchi, Tsutomu; Masuda, Hisako; Okazaki, Hiroshi; Handa, Mitsuaki; Sugawara, Yutaka; and Ogawa, Haruki, to Chugai Seiyaku Kabushiki Kaisha. Anti-tumor preparation against certain tumors and process for preparing the same. 4,349,541, Cl. 424-95.000.

Takekoshi, Tohru; and Webb, Jimmy L., to General Electric Company. Method of salvaging aromatic bisimide values. 4,349,479, Cl. 260-326.00N.

Takemoto, Iwao: *See—*
Ohba, Shinya; Hanamura, Shoji; Ozaki, Toshifumi; Kubo, Masaharu; Nakai, Masaaki; Takahashi, Kenji; Aoki, Masakazu; Takemoto, Iwao; Ando, Haruhisa; and Izawa, Ryuichi, 4,349,743, Cl. 250-578.000.

Takeno, Hidekazu: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.

Takeshita, Masatoshi: *See—*
Suzuki, Ryo; Uehara, Keiichi; Takeuchi, Teruaki; and Takeshita, Masatoshi, 4,349,892, Cl. 365-8.000.

Takeuchi, Teruaki: *See—*
Suzuki, Ryo; Uehara, Keiichi; Takeuchi, Teruaki; and Takeshita, Masatoshi, 4,349,892, Cl. 365-8.000.

Takida, Hiroshi: *See—*
Iwanami, Teruo; Takida, Hiroshi; and Fujita, Yukio, 4,349,644, Cl. 525-57.000.

Takusagawa, Takashi: *See—*
Hirakawa, Hiroshi; Sato, Akio; Takusagawa, Takashi; and Ikeda, Nobumasa, 4,349,061, Cl. 152-209.00R.

Taleff, Alexander: *See—*
Wilks, Robert S.; Taleff, Alexander; and Sturges, Robert H., Jr., 4,349,112, Cl. 209-538.000.

Talon, Inc.: *See—*
Brown, Robert H., 4,348,789, Cl. 24-205.10R.

Tamano, Tokuo. Apparatus for defrosting frozen foods and continuously supplying same defrosted. 4,349,714, Cl. 219-10.55A.

Tamba, Shinichi: *See—*
Fujikawa, Tetsuzo; and Tamba, Shinichi, 4,348,862, Cl. 60-314.000.

Tamura, Hiroshi: *See—*
Kawashiri, Kazuhiro; Mizobuchi, Yuzo; Higashi, Akio; Tamura, Hiroshi; Takeda, Keiji; and Nagata, Masayoshi, 4,349,617, Cl. 430-59.000.

Tanaka, Atsushi: *See—*
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, 4,348,981, Cl. 118-730.000.

Tanaka, Fujio: *See—*
Nagasawa, Kohtaro; Ochi, Hideo; Tanaka, Fujio; and Shibata, Yumi, 4,349,647, Cl. 525-285.000.

Tanaka, Hirokazu: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,349,466, Cl. 260-112.50R.

Tanaka, Hiromi: *See—*
Tanaka, Itsuo; and Tanaka, Hiromi, 4,349,362, Cl. 55-390.000.

Tanaka, Itsuo; and Tanaka, Hiromi, to Sumitomo Heavy Industries, Ltd. Multi-stage moving bed type adsorption device. 4,349,362, Cl. 55-390.000.

Tanaka, Kimio; and Ishida, Toshihiko, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,349,166, Cl. 242-197.000.

Tanaka, Shoichi: *See—*
Ishiwata, Shoji; Kuroda, Yasuo; Tanaka, Shoichi; Watanabe, Tsuneo; and Hasegawa, Shinichi, 4,349,513, Cl. 423-12.000.

Tanaka, Susumu: *See—*
Wada, Kenichi; Tanaka, Susumu; and Tabuchi, Kenji, 4,349,270, Cl. 355-15.000.

Tanaka, Toshiaki; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Internal combustion engine. 4,348,994, Cl. 123-198.00F.

Tanaka, Yoshio; Nishikawa, Yasuhisa; and Hasumi, Ryoichi, to Clarion Co., Ltd. Pushbutton. 4,348,911, Cl. 74-10.330.

Tang, Daniel K.: *See—*
Lehnhardt, William F.; Streaty, Charles E., Jr.; Yackel, Walter C., Jr.; Yang, Ho S.; and Tang, Daniel K., 4,349,576, Cl. 426-582.000.

Tani, Haruhisa: *See—*
Yazawa, Masahide; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,349,500, Cl. 264-159.000.

Taniguchi, Katsuo: *See—*
Takahata, Kazunori; Taniguchi, Katsuo; and Fujimoto, Tadaaki, 4,349,419, Cl. 203-70.000.

Taniguti, Ryosuke: *See—*
Ishibashi, Naoto; Taniguti, Ryosuke; Miyaji, Junichi; and Ichinose, Yosaburo, 4,349,813, Cl. 340-638.000.

Tappe, Horst; Kindler, Horst; Roth, Kurt; and Weyer, Hans-Jurgen, to Cassella Aktiengesellschaft. Process for printing synthetic, hydrophobic fiber material. 4,349,348, Cl. 8-464.000.

Tarancon, Gregorio, to Union Carbide Corporation. Method of mixing a gas and a vaporizable liquid. 4,349,358, Cl. 55-89.000.

Tarkkanen, Veikko: *See—*
Kolehmainen, Seppo; and Tarkkanen, Veikko, 4,349,510, Cl. 422-66.000.

Tarng, Ming L.; and Hicinbothem, Walter A., Jr., to RCA Corporation. Method of depositing a refractory metal on a semiconductor substrate. 4,349,408, Cl. 156-628.000.

Tarumizu, Yasumasa: *See—*
Ichimura, Masaaki; Tarumizu, Yasumasa; and Uranaka, Kiyouzi, 4,348,864, Cl. 60-454.000.

Tatis Plasttantningar AB: *See—*
Dahlberg, Anders, 4,349,401, Cl. 156-221.000.

Tawada, Hiroyuki: *See—*
Meguro, Kanji; Tawada, Hiroyuki; and Matsuo, Takao, 4,349,547, Cl. 424-244.000.

Taylor, Carl R.: *See—*
Aloisio, Charles J., Jr.; Blyler, Lee L., Jr.; Brockway, George S.; Hart, Arthur C., Jr.; and Taylor, Carl R., 4,349,587, Cl. 427-163.000.

Taylor, Heyward T.; and Lambert, Michael B. Regenerative energy transfer system. 4,348,863, Cl. 60-327.000.

Taylor, Scot W.: *See—*
Davis, Earl K.; Landron, Rafael; and Taylor, Scot W., 4,349,635, Cl. 501-15.000.

TDK Electronics Co., Ltd.: *See—*
Tanaka, Kimio; and Ishida, Toshihiko, 4,349,166, Cl. 242-197.000.

Tedeschi, Rinaldo R.: *See—*
Hendrix, Tony D.; and Tedeschi, Rinaldo R., 4,348,893, Cl. 73-116.000.

Teijin Seiki Company Limited: *See—*
Fukui, Kiyozumi, 4,348,918, Cl. 74-805.000.

Telefonaktiebolaget L M Ericsson: *See—*
Skoog, Karl I. L., 4,349,913, Cl. 375-25.000.

Tennant Company: *See—*
Swanson, Albert S.; and Geyer, Robert A., 4,348,783, Cl. 15-320.000.

Terakawa, Toshiaki, to Fujitsu Limited. System for driving a plasma display panel device. 4,349,819, Cl. 340-812.000.

Terakura, Yukio: *See—*
Ito, Takayoshi; Kubo, Seitoku; and Terakura, Yukio, 4,349,088, Cl. 192-3.300.

Terneu, Robert, to BFG Glassgroup. Process for coating glass. 4,349,370, Cl. 65-60.400.

Terneu, Robert: *See—*
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,369, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,371, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,372, Cl. 65-60.400.

Terrel, Christopher, to Chloride Group Public Limited Company. Lamp mounting. 4,349,865, Cl. 362-250.000.

Terrell Machine Company, The: *See—*
Niederer, Kurt W., 4,349,160, Cl. 242-18.00R.

Teruyama, Hiroichi: *See—*
Hoshi, Hideo; Mitsugi, Shiro; Teruyama, Hiroichi; and Tabata, Hideo, 4,349,763, Cl. 310-370.000.

Tessler, Martin M., to National Starch and Chemical Corp. Starch-protein clouds and preclouds. 4,349,577, Cl. 426-590.000.

Texaco Inc.: *See—*
Ganster, Charles A.; and Nelson, Gerald V., 4,349,884, Cl. 364-557.000.

Texas Instruments Incorporated: *See—*
Boulanger, Henry J., 4,349,806, Cl. 337-343.000.
Caudel, Edward R., 4,349,894, Cl. 365-154.000.

Textron, Inc.: *See—*
Hughes, Charles W.; Harvey, Keith W.; and Sonneborn, Walter G. O., 4,349,316, Cl. 416-104.000.
Olmr, Jaroslav J., 4,348,927, Cl. 83-833.000.

Tezuka, Nobuo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetically driven shutter. 4,349,264, Cl. 354-234.000.

Thamerus, Theobald, to Hauni-Werke Korber & Co. KG. Apparatus for temporary storage of stacked cigarettes or the like. 4,349,096, Cl. 198-347.000.

Theriault, Mario: *See—*
Dumont, Antonio J.; and Theriault, Mario, 4,348,801, Cl. 29-564.300.

Theroux, Jean P., to General Electric Company. Semiconductor device having glass and metal package. 4,349,831, Cl. 357-74.000.

Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines). Apparatus for the boronizing of pieces made of metal or cermet and surface-bornished pieces. 4,348,980, Cl. 118-717.000.

Thomas, David T.: *See—*
Bixler, Stephen D.; Thomas, David T.; and Archer, Donald H., 4,349,827, Cl. 343-786.000.

Thomas, Hubert E. Variable amplitude vibrator apparatus. 4,348,912, Cl. 74-61.000.

Thomas, Joseph J.; Vaillancourt, Vincent L.; Millet, Marcus J.; and Smith, William F., to Johnson & Johnson. Blood collection assembly with unidirectional flow valve. 4,349,035, Cl. 128-766.000.

Thompson, Joseph, to Northern Telecom Limited. Wall mounting adaptor for telephone set. 4,349,706, Cl. 179-100.00C.

Thompson, Leonard J., to Crosby Valve & Gage Company. Set pressure measuring system. 4,349,885, Cl. 364-558.000.

Thompson, Roger S., to U.S. Philips Corporation. Phase-compensated integrated circuit. 4,349,797, Cl. 333-215.000.

"Thomson-Brandt": *See—*
Fulchiron, Noel; and Naillon, Bernard, 4,348,936, Cl. 89-1.50D.

Thomson-CSF: *See—*
Daniel, Jean P., 4,349,838, Cl. 358-125.000.
Decalonne, Jacques, 4,349,822, Cl. 340-870.340.

Thornton, Douglas M., to Ross Operating Valve Company. Electrical terminal construction. 4,349,176, Cl. 251-129.000.

Timmler, Helmut; Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pesticidally active 1-acyloxy-1-phenyl-2-azolyl-ethanes. 4,349,556, Cl. 424-269.000.

Tippins, George W., to Tippins Machinery Company, Inc. Hot rolling strip. 4,348,882, Cl. 72-202.000.

Tippins Machinery Company, Inc.: *See—*
Tippins, George W., 4,348,882, Cl. 72-202.000.

TMC Corporation: *See—*
Svoboda, Josef, 4,349,212, Cl. 280-610.000.

Tobin, Thomas J., to S&C Electric Company. Fuse tube. 4,349,803, Cl. 337-186.000.

Toivonnen, Hannu J., to Kemira Oy. Process for the production of air drying modified amino resin. 4,349,660, Cl. 528-261.000.

Tokico Ltd.: *See—*
Hayashida, Yoshihiro, 4,348,866, Cl. 60-561.000.
Maeda, Koichi, 4,349,735, Cl. 260-229.000.

Tokunaga, Hiroshi: *See—*
Toyokura, Nobuo; Tokunaga, Hiroshi; Inoue, Shinichi; Ishikawa, Hajime; and Shinoda, Masaichi, 4,349,395, Cl. 148-187.000.

Tokyo Electric Co., Ltd.: *See—*
Uchimura, Mitsuo; and Nishimura, Yoshiharu, 4,349,891, Cl. 364-900.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ishii, Shoichi; Hagiwara, Taiken; and Shimanuki, Masanobu, 4,349,848, Cl. 360-66.000.
Nakamura, Kunihiko, 4,349,186, Cl. 271-18.000.
Nakanisi, Takatosi; Tanaka, Atsushi; and Udagawa, Takashi, 4,348,981, Cl. 118-730.000.
Otsuka, Kenichi; Uchino, Hiroshi; and Nakajima, Kihei, 4,349,867, Cl. 363-160.000.
Sato, Yoshihisa, 4,349,853, Cl. 361-19.000.

Tomes, Marcus B. Offroad vehicle inclinometer and alarm. 4,349,809, Cl. 340-52.00H.

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Toray Industries, Inc.: *See—*
Hiramatsu, Toru; Koseki, Teruo; Hamada, Satosi; and Sumida, Atsushi, 4,349,523, Cl. 423-447.400.

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Maximenko, Alexandr V.; Torchilin, Vladimir P.; Smirnov, Vladimir N.; and Chazov, Evgeny I., 4,349,630, Cl. 435-180.000.

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Tork, Inc.: *See—*
Petersen, Warren A., 4,349,863, Cl. 362-20.000.

Toscano, Robert J.: *See—*
Charles, Joel M.; and Toscano, Robert J., 4,349,180, Cl. 254-277.000.

Towae, Friedrich: *See—*
Merger, Franz; Nestler, Gerhard; Towae, Friedrich; and Harder, Wolfgang, 4,349,484, Cl. 260-453.00P.

Toyo Engineering Corporation: *See—*
Wakao, Noriaki, 4,349,356, Cl. 55-16.000.

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Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; and Hayashi, Mitsuo, 4,349,667, Cl. 536-13.900.

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Hiraga, Yoichi; Watanabe, Osamu; and Nakatani, Masaki, 4,349,519, Cl. 423-321.00S.

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Kinaga, Eiichi, 4,349,226, Cl. 297-475.000.
Masuda, Yoshihiko, 4,349,003, Cl. 123-568.000.
Takeda, Keiso; Inouye, Shozo; and Kashiwakura, Toshimi, 4,348,997, Cl. 123-445.000.
Ueno, Kazunori; Isobe, Masahiro; and Hoshi, Setsuo, 4,348,993, Cl. 123-146.50A.

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Traino, James C., to Xerox Corporation. Image size control for raster scanners. 4,349,847, Cl. 358-293.000.

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TransAgra Corporation: *See—*
Peer, Herbert R., 4,349,569, Cl. 426-43.000.

Transfer Print Foils, Inc.: *See—*
Parker, Harry A., 4,349,402, Cl. 156-233.000.

Transfluid s.r.l.: *See—*
Pavesi, Franco, 4,349,094, Cl. 192-109.00F.

Transformatoren Union AG: *See—*
Altmann, Garhard; and Pfeiffer, Richard, 4,349,801, Cl. 336-84.00C.

Trapp, Horst: *See—*
Klahr, Erhard; Trieselt, Wolfgang; Trapp, Horst; and Widder, Rudi, 4,349,669, Cl. 536-127.000.

Treadwell, Buford W. Snowshoe and harness assembly. 4,348,824, Cl. 36-125.000.

Tressa, Inc.: *See—*
Forbriger, Arthur W., Jr., 4,349,537, Cl. 424-71.000.

Trieselt, Wolfgang: *See—*
Klahr, Erhard; Trieselt, Wolfgang; Trapp, Horst; and Widder, Rudi, 4,349,669, Cl. 536-127.000.

Trinity Industries, Inc.: *See—*
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Troponwerke GmbH & Co. KG: *See—*
Jacobi, Haireddin; Opitz, Wolfgang; and Etschenberg, Eugen, 4,349,543, Cl. 424-177.000.

TRW Inc.: *See—*
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., 4,349,794, Cl. 333-141.000.

Tryzna, Miloslav: *See—*
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Huston, Larry; Morrison, Clifton H.; Rasmussen, Glenn; and Tsuchiya, Takuzo, 4,348,923, Cl. 83-23.000.

Tsuchiya, Tsutomu: *See—*
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Tsuji, Kozo: *See—*
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Tsujio, Hisami, to Aisin Seiki Company, Limited. Clutch facing. 4,349,093, Cl. 192-107.00R.
Tsukamura, Yoshihiro: *See—*
Muramoto, Shoichi; Tsukamura, Yoshihiro; Tozawa, Masayuki; and Ishii, Fusao, 4,349,767, Cl. 313-449.000.
Tsuru, Mario, to Nissan Motor Co., Ltd. Closure member for an automotive drive shaft assembly. 4,348,875, Cl. 464-170.000.
Tsurunaga, Yasuaki; Abe, Masaru; Hashimoto, Hideaki; and Tsuzura, Junichi, to Bridgestone Tire Company Limited. Highly durable pneumatic tire comprising bias laid carcass construction formed of superimposed stacked plies. 4,349,062, Cl. 152-356.00R.
Tsuzura, Junichi: *See—*
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Tuttle, Richard P.: *See—*
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Uchimura, Mitsuo; and Nishimura, Yoshiharu, to Tokyo Electric Co., Ltd. Postal charge processing system which calculates and displays the difference between the postal charge and the stamp for when the postal charge is greater. 4,349,891, Cl. 364-900.000.
Uchino, Hiroshi: *See—*
Otsuka, Kenichi; Uchino, Hiroshi; and Nakajima, Kihei, 4,349,867, Cl. 363-160.000.
Udagawa, Takashi: *See—*
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Suzuki, Ryo; Uehara, Keiichi; Takeuchi, Teruaki; and Takeshita, Masatoshi, 4,349,892, Cl. 365-8.000.
Uematsu, Tamon; Inoue, Satoru; and Yamashita, Norihisa, to Sumitomo Chemical Company, Limited. Method of using carbostyril derivatives as plant fungicides. 4,349,554, Cl. 424-258.000.
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Ukachi, Takashi: *See—*
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Ulivi C., Ilio J.: *See—*
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Ulm, Helmut: *See—*
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Ulmer, Harry E.: *See—*
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UMC Industries, Inc.: *See—*
Shah, Hasmukh R.; Jones, Thaddeus M.; and Hemingway, Bruce R., 4,349,111, Cl. 209-534.000.
Umemura, Kazuhiro: *See—*
Asada, Akihiro; Nakata, Kazuo; Umemura, Kazuhiro; Sato, Hirokazu; Murakami, Kenya; and Into, Kiyoshi, 4,349,699, Cl. 179-1.0SM.
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Miyake, Toshiaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the production of kanomycin B derivatives and products obtained therefrom. 4,349,666, Cl. 536-13.800.
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Union Carbide Corporation: *See—*
Belz, Herman M., 4,349,910, Cl. 373-91.000.
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Jorgensen, Robert J.; Goeke, George L.; and Karol, Frederick J., 4,349,648, Cl. 526-125.000.
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Unisearch Limited: *See—*
Wainwright, Mark S.; Marsden, Warwich L.; and Friedrich, Jan B., 4,349,464, Cl. 252-463.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
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Air Force: *See—*
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Army: *See—*
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Schmidlin, Albertus E., 4,348,956, Cl. 102-377.000.
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Energy: *See—*
Brixner, Berlyn B.; Klein, Morris M.; and Winkler, Max A., 4,349,249, Cl. 350-483.000.
Campillo, Anthony J.; Hyer, Ronald C.; and Shapiro, Stanley J., 4,349,907, Cl. 372-92.000.
Lu, Wen-Tong P.; and Ammon, Robert L., 4,349,428, Cl. 204-294.000.
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Rawls, John M.; and Peuron, Unto A., 4,349,506, Cl. 376-142.000.
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Sovey, James S.; Forman, Ralph; Curren, Arthur N.; and Wintucky, Edwin G., 4,349,424, Cl. 204-192.00E.
Navy: *See—*
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Boehme, Hollis; Barnard, Garland R.; Mellenbruch, Larry L.; and Dickens, Danny W., 4,349,897, Cl. 367-98.000.
Harris, Eleanor S., 4,349,824, Cl. 343-700.0MS.
Mueller, Kurt F.; Chang, Marguerite S.; Farncomb, Robert F.; and Malotky, Lyle O., 4,349,396, Cl. 149-19.300.
Pae, Kook D.; Newman, Brian A.; and Scheinbeim, Jerry I., 4,349,502, Cl. 264-320.000.
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U.S. Philips Corporation: *See—*
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Bloem, Herman, 4,348,793, Cl. 29-157.30A.
Deunhouwer, Anthony H.; and Kock, Hendrikus G., 4,348,795, Cl. 29-411.000.
Geurts, Martinus F. A. M., 4,349,750, Cl. 307-243.000.
Huisman, Hendrikus F.; and Groen, Harm Jan, 4,349,385, Cl. 106-37.000.
Janssen, Peter J. H.; and Christis, Wilhelmus J., 4,349,904, Cl. 371-69.000.
Mentink, Henricus; and van Rooijen, Hendrikus, 4,349,721, Cl. 219-145.230.
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Thompson, Roger S., 4,349,797, Cl. 333-215.000.
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Gastmeier, William J., 4,349,082, Cl. 181-130.000.
University of California, The Regents of the: *See—*
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Marks, Stephen B., 4,349,446, Cl. 252-70.000.
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UOP Inc.: *See—*
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Upjohn Company, The: *See—*
Aristoff, Paul A., 4,349,689, Cl. 560-117.000.
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Uranaka, Kiyouzi: *See—*
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Uroshevich, Miroslav, to Alpha Solarco Inc. Solar energy receivers. 4,349,013, Cl. 126-442.000.
Urushihara, Kazunobu: *See—*
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USM Corporation: *See—*
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Vahldiek, Fred W. Method for increasing the ductility and conductivity of refractory crystals. 4,349,636, Cl. 501-87.000.
Vaillancourt, Vincent L.: *See—*
Thomas, Joseph J.; Vaillancourt, Vincent L.; Millet, Marcus J.; and Smith, William F., 4,349,035, Cl. 128-766.000.
Valachovic, John; Alphonse, Gerard A.; Reisner, John H.; and Etzold, Karl-Friedrich, to RCA Corporation. Piezoelectric transducer for recording video information. 4,349,902, Cl. 369-132.000.
Van Cauter, Albert: *See—*
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,369, Cl. 65-60.400.

Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,371, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,349,372, Cl. 65-60.400.
Vancsa, Gyorgy I., to Westinghouse Electric Corp. Data acquisition system and analog to digital converter therefor. 4,349,821, Cl. 340-870.210.
van den Elzen, Hendricus C.; Van Gerwen, Petrus J.; Snijders, Wilfred A. M.; and Verhoeckx, Nicolaas A. M., to U.S. Philips Corporation. Non-recursive filter having adjustable step-size for each iteration. 4,349,889, Cl. 364-724.000.
Van Gerwen, Petrus J.: *See*—
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Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, to BFG Glassgroup. Process for coating glass. 4,349,369, Cl. 65-60.400.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, to BFG Glassgroup. Process for coating glass. 4,349,371, Cl. 65-60.400.
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Vanlerberghe, Guy; Sebag, Henri; and Zysman, Alexandre. Cosmetic compositions based on poly-(quaternary ammonium) polymers. 4,349,532, Cl. 424-47.000.
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Van Scoyk, Pershing R.; and Welton, Charles L. Tiedown and instep straps for spurs. 4,348,854, Cl. 54-83.00R.
Varco International, Inc.: *See*—
Boyadjieff, George I., 4,348,920, Cl. 81-57.250.
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Vasilieva, Elena D.: *See*—
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Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,349,882, Cl. 364-509.000.
Veenhof, Willem D. Conveyor belt cleaning or scraping devices. 4,349,098, Cl. 198-497.000.
Velenyi, Louis J.; and Dolhyj, Serge R., to SOHIO. Catalytic material. 4,349,462, Cl. 252-455.00R.
Ventura, Daniel S.: *See*—
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Vervecken, Karel R.: *See*—
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Veznik, Zdenek: *See*—
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Vickers, Derek; and Waterhouse, John C., to Fenamec (Australia) Pty. Ltd. Storage rack. 4,349,114, Cl. 211-151.000.
Victor Company of Japan, Limited: *See*—
Iwahara, Makoto, 4,349,698, Cl. 179-1.00G.
Viecelli, Jack C.: *See*—
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Vik, Darrell D. Adjustable waterer. 4,348,989, Cl. 119-72.000.
Vives, Jean-Patrick, to Les Cables de Lyon. Sub-marine telephone cable. 4,349,694, Cl. 174-128.00R.
Vivian, J. Edward: *See*—
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Ogawa, Mitsuru; and Iwamatsu, Seiichi, 4,348,804, Cl. 29-580.000.
Voith Transmit GmbH: *See*—
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Volka, Lubomir J.; and Wentzel, Robert J., to Burroughs Corporation. Tilt device for use with cathode ray tube display units. 4,349,173, Cl. 248-346.000.
Von Roll A.G.: *See*—
Sturm, Werner, 4,349,219, Cl. 285-21.000.
von Beck, Harold F. V., to Combustion Engineering, Inc. Regenerative air heater. 4,349,069, Cl. 165-4.000.
von Gutfeld, Robert J.: *See*—
Kulynych, Larysa H.; Romankiw, Lubomyr T.; and von Gutfeld, Robert J., 4,349,583, Cl. 427-53.100.
Vorwerk & Co. Interholding GmbH: *See*—
Simm, Hans-Peter; Guhne, Wieland; and Hoffmann, Klaus, 4,349,206, Cl. 277-207.00R.
Voyer, Peter E.: *See*—
Munroe, Alan D.; and Voyer, Peter E., 4,349,313, Cl. 415-174.000.
Vozoff, Keeva, to University of California, The Regents of the. Superconducting gradiometer-magnetometer array for magnetotelluric logging. 4,349,781, Cl. 324-346.000.
Vulcano, Richard. Racquet handle. 4,349,199, Cl. 273-75.000.
Vural, Gulertan; and Blancke, Uwe, to Koehring GmbH-BOMAG Division. Apparatus for monitoring the degree of compaction. 4,348,901, Cl. 73-594.000.
W. E. Healey and Associates, Inc.: *See*—
Healey, William E.; and Heineman, Morse R., 4,349,812, Cl. 340-522.000.
W. H. D. Development Limited: *See*—
Sharpe, Derrick, 4,349,108, Cl. 206-506.000.
W. R. Grace & Co.: *See*—
Block, Jacob, 4,349,443, Cl. 252-8.50A.
Fulmer, Glenn E., 4,349,494, Cl. 264-45.300.
Waaben, Sigurd G.: *See*—
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WABCO Fahrzeugbremsen GmbH: *See*—
Lindemann, Klaus, 4,349,876, Cl. 364-426.000.
Wada, Kenichi; Tanaka, Susumu; and Tabuchi, Kenji, to Minolta Camera Co., Ltd. Developer removing device for copying apparatus. 4,349,270, Cl. 355-15.000.
Wade, David R., to Baldwin Piano & Organ Company. Simulating wind noise in electronic organs using digital noise generators. 4,348,931, Cl. 84-1.240.
Wagner, William R., to Rockwell International Corporation. Compact diesel fuel preheater element. 4,349,001, Cl. 123-557.000.
Wahlstrom, Hans V.; Nilsson, Rolf E.; and Pihlgren, Kjell A., to Wahlstrom, Hans V.; and Nilsson, Rolf E. Hose cleaning plant. 4,348,781, Cl. 15-40.000.
Wainwright, Basil E. Apparatus for producing spark ignition of an internal combustion engine. 4,349,008, Cl. 123-620.000.
Wainwright, Mark S.; Marsden, Warwich L.; and Friedrich, Jan B., to Unisearch Limited. Catalysts for methanol synthesis and method for their production. 4,349,464, Cl. 252-463.000.
Waitz, J. Allan: *See*—
Lee, Bong K.; Marquez, Joseph A.; and Waitz, J. Allan, 4,349,665, Cl. 536-7.100.
Wakamoto Pharmaceutical Co., Ltd.: *See*—
Yamada, Masahide; Edanami, Kenichi; and Kuroda, Toshio, 4,349,546, Cl. 424-180.000.
Wakao, Noriaki, to Toyo Engineering Corporation. Process and apparatus for concentrating a component of a gaseous mixture. 4,349,356, Cl. 55-16.000.
Wakefield, Felix R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Gas gun for ballistic testing. 4,349,200, Cl. 273-371.000.
Walle, Richard V.: *See*—
Strader, Charles J.; and Walle, Richard V., 4,348,840, Cl. 52-180.000.
Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Process for producing imidazodiazepines. 4,349,475, Cl. 260-244.400.
Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Process for producing imidazodiazepines. 4,349,476, Cl. 260-244.400.
Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Process for producing imidazodiazepines. 4,349,477, Cl. 260-244.400.
Wampler, D. Eugene, to Merck & Co., Inc. Separation of hepatitis B surface antigen. 4,349,539, Cl. 424-89.000.
Wang, Ke-Li: *See*—
Kagiwada, Reynold S.; Yen, Kuo-Hsiung; Wang, Ke-Li; Lau, Kei F.; Lochhead, Donald L.; and Leaverton, James A., 4,349,794, Cl. 333-141.000.
Wang, Pen-Chung: *See*—
Renga, James M.; and Wang, Pen-Chung, 4,349,487, Cl. 260-465.00F.
Wasserlein, Henry G., Jr.: *See*—
Roberts, Lincoln E.; and Wasserlein, Henry G., Jr., 4,349,239, Cl. 339-97.00R.
Watanabe, Hironori: *See*—
Sakashita, Noriji; Kugisawa, Toshio; Watanabe, Hironori; and Kitagawa, Hiroshi, 4,348,928, Cl. 84-1.010.
Watanabe, Masanori: *See*—
Kitai, Kiyoshi; Kobayashi, Masaru; Nakagawa, Tadashi; Ishida, Hiroaki; Watanabe, Masanori; and Takazawa, Yuzuru, 4,349,258, Cl. 354-127.000.
Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corporation. Process for recovery of reusable chromic acid from the waste chromic acid solution containing impurities. 4,349,514, Cl. 423-54.000.
Watanabe, Osamu: *See*—
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Watanabe, Tsuneo: *See*—
Ishiwata, Shoji; Kuroda, Yasuo; Tanaka, Shoichi; Watanabe, Tsuneo; and Hasegawa, Shinichi, 4,349,513, Cl. 423-12.000.
Watanabe, Yoshitaka, to Canon Kabushiki Kaisha. Automatic film winding device having a movable grip member. 4,349,262, Cl. 354-173.000.

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Waterhouse, John C.: *See—*
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Weall, Paul: *See—*
Adams, Keith J. G.; Brightwell, Alan; Price, Barry L.; Pegler, Stuart M.; and Weall, Paul, 4,349,745, Cl. 307-12.000.

Webb, David E.; and Andrews, Lawrence F. Orthodontic bracket assembly. 4,349,334, Cl. 433-9.000.

Webb, Jimmy L.: *See—*
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Wedeking, Paul W.: *See—*
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Weeden, Frank G.: *See—*
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Wegner, Wilhelm: *See—*
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Wei, Lawrence S., to Siemens Corporation. Method of making a zener diode utilizing gas-phase epitaxial deposition. 4,349,394, Cl. 148-175.000.

Wei, Peter H. L.: *See—*
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Weiger, Gunter: *See—*
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Weikel, Maurice M. Sliding dental amalgam dispenser. 4,349,125, Cl. 221-96.000.

Weinert, Hans, to Ringsdorff-Werke GmbH. Method for the manufacture of segments for commutators. 4,349,384, Cl. 75-208.00R.

Weinstein, David: *See—*
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Weiser, Klaus: *See—*
Carota, Martin; Slootz, Josef; Weiser, Klaus; Gulich, Peter; and Jovanovic, Milenko, 4,349,718, Cl. 219-78.010.

Weiss, Herbert W., to General Electric Company. Method and apparatus for controlling an alternating current motor load using plural controlled-current inverter circuits. 4,349,772, Cl. 318-799.000.

Weissman, Bernard, to Ipco Hospital Supply Corporation. Oval dental anchor. 4,349,335, Cl. 433-225.000.

Weissman, Bernard, to Ipco Hospital Supply Corporation. Square dental anchor. 4,349,336, Cl. 433-225.000.

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Welton, Charles L.: *See—*
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Wentzel, Robert J.: *See—*
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Werth, John, to Exide Corporation. Platinum third electrode to improve float polarization of standby batteries. 4,349,614, Cl. 429-50.000.

West, Frank L.; and Norton, Larry A., to Chromalloy American Corporation. Safety start control for electrically powered apparatus. 4,349,856, Cl. 361-160.000.

Westamarin A/S: *See—*
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Whitby, Clyde M.; and White, Douglas L., deceased (by White, Elizabeth A., administrator), to Singer Company, The. Laser spatial stabilization transmission system. 4,349,732, Cl. 250-201.000.

White, Anthony D. Open end wrench. 4,348,921, Cl. 81-91.00C.

White, Douglas L., deceased: *See—*
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White, James W.; and McDermott, Joseph J., deceased (by McDermott, Rosalie L., executrix), to United States of America, Army. Boattail emergence by ejecting nozzle exit cone. 4,348,957, Cl. 102-378.000.

White, Michael L., to Minnesota Mining and Manufacturing Company. High incidence angle retroreflective material. 4,349,598, Cl. 428-161.000.

Whitehead, Michael J.: *See—*
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Whitehouse, Martin G.: *See—*
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Wiknich, Douglas D.; and Peabody, Michael J., to LaSalle Machine Tool, Inc. Accumulating conveyor. 4,349,099, Cl. 198-751.000.

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Wilks, Robert S.; Taleff, Alexander; and Sturges, Robert H., Jr., to United States of America, Energy. Pellet inspection apparatus. 4,349,112, Cl. 209-538.000.

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Sovey, James S.; Forman, Ralph; Curren, Arthur N.; and Wintucky, Edwin G., 4,349,424, Cl. 204-192.00E.

Wirt, Thomas M.; and Chechile, Robert A., to Litton Systems Inc. Spring for a ring laser gyro dither mechanism. 4,349,183, Cl. 267-160.000.

Wirtz, John W.; and Schenk, Raymond L., to Wirtz Manufacturing Company, Inc. Machine and method for continuously casting battery grids. 4,349,067, Cl. 164-479.000.

Wirtz Manufacturing Company, Inc.: *See—*
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Wise, David S., to McGraw-Hill, Inc. Coreless roll film structure and apparatus for winding thereof. 4,349,163, Cl. 242-68.300.

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Woods, William E.; Stanley, Philip E.; Cushing, David E.; and Lemay, Richard A., to Honeywell Information Systems Inc. Buffer system for supply procedure words to a central processor unit. 4,349,874, Cl. 364-200.000.
Woodson, Thomas W., to Christian Leather Company, Inc., The. Weight lifter's belt. 4,348,774, Cl. 2-338.000.
Wool Development International Limited: *See—*
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Woolfolk Chemical Works, Inc.: *See—*
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Worne, Howard E.; and Rabinovitch, Irving. Process of microbial extraction of hydrocarbons from oil sands. 4,349,633, Cl. 435-281.000.
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Bain, Kenneth J. D.; King, Dennis E.; Worship, Lesley A.; and Burton, Achmat T., 4,349,117, Cl. 220-4.00F.
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Yamada, Hideo. Circulating food display system. 4,349,086, Cl. 186-49.000.
Yamada, Masahide; Edanami, Kenichi; and Kuroda, Toshio, to Wakamoto Pharmaceutical Co., Ltd. D-Allose derivative and preparation method therefor. 4,349,546, Cl. 424-180.000.
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Yamashita, Yoshisato; and Matsuo, Yutaka, to Chisso Corporation. Process for producing purified hydrochloric acid. 4,349,524, Cl. 423-488.000.
Yamashita, Yoshisato; and Matsuo, Yutaka, to Chisso Corporation. Process for purifying hydrochloric acid produced from alkali chloride and sulfuric acid. 4,349,525, Cl. 423-488.000.
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, to Kabushiki Kaisha Kurio-Medikaru. Apparatus for refrigeration treatment. 4,348,873, Cl. 62-514.00R.
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Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Nakajima, Toshio, to Ishihara Sangyo Kaisha, Ltd. 2-Amino-3-chloro-5-trifluoromethylpyridine. 4,349,681, Cl. 546-304.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Complementary differential amplifier circuit having source-follower driving circuits. 4,349,786, Cl. 330-253.000.
Yonezawa, Keitaro. Auxiliary die conveyor for a pressing or punching machine. 4,348,883, Cl. 72-446.000.
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Yoshikawa, Yoshio; Nawata, Takanari; Goto, Mikio; and Kondo, Yukio, to Mitsubishi Gas Chemical Co., Inc. Oxygen indicator adapted for printing or coating and oxygen-indicating device. 4,349,509, Cl. 422-57.000.
Young, William G. Re-registering feeder and method of registering. 4,349,188, Cl. 271-225.000.
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Zambelli, Adolfo: *See—*
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Zenith Radio Corporation: *See—*
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Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W. Tube mat heat exchanger. 4,349,070, Cl. 165-173.000.
Zinser Textilmaschinen GmbH, Firma: *See—*
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Zizza, John M. Automobile control module. 4,349,861, Cl. 361-347.000.
Zokor Corporation: *See—*
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Zoll, Ross H.: *See*—
Belgard, Alan H.; Zoll, Paul M.; and Zoll, Ross H., 4,349,030, Cl. 128-419.0PG.
Zolnowsky, John E.: *See*—
Gunter, Thomas G.; Zolnowsky, John E.; and Crudele, Lester M., 4,349,873, Cl. 364-200.000.
Zuber, Bretislav; and Kral, Jaroslav J., to Northern Telecom Limited.
Sensor device for continuous measurement of jacket thickness on a cable. 4,349,780, Cl. 324-262.000.
Zublin, Casper M.: *See*—
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Zublin, Casper W., to Zublin, Casper M. Hydraulic jet well cleaning. 4,349,073, Cl. 166-312.000.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF SEPTEMBER, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cromwell Metals, Inc.: *See—*
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598 4,348,791
857 4,348,805
863 4,348,806

CLASS 30

123.6 4,348,807
134 4,348,808
138 4,348,809
210 4,348,810

CLASS 33

125 R 4,348,811
147 K 4,348,812
172 R 4,348,813
178 E 4,348,814
419 4,348,815

CLASS 34

13 4,348,816
75 4,348,817
77 4,348,818
110 4,348,819

CLASS 36

101 4,348,820
103 4,348,821
122 4,348,822
123 4,348,823
125 4,348,824

CLASS 37

222 4,348,825

CLASS 40

155 4,348,826
607 4,348,827

CLASS 42

1 A 4,348,828
1 N 4,348,829

CLASS 46

26 4,348,830

CLASS 47

1 R 4,348,832
17 4,348,833
32 4,348,831
58 4,348,834

CLASS 48

77 4,349,354
111 4,349,355

CLASS 49

139 4,348,835
311 4,348,836

CLASS 51

5 R 4,348,837
34 C 4,348,838
281 R 4,348,839

CLASS 52

126.5 4,348,841
166 4,348,842
167 4,348,843
180 4,348,840
230 4,348,844
405 4,348,845
410 4,348,846
426 4,348,847
432 4,348,848
545 4,348,849
693 4,348,850

CLASS 53

75 4,348,851
469 4,348,852
566 4,348,853

CLASS 54

83 R 4,348,854

CLASS 55

16 4,349,356
21 4,349,357
89 4,349,358
151 4,349,359
238 4,349,360
357 4,349,361
390 4,349,362
498 4,349,363

CLASS 56

10.2 4,348,855
30 4,348,856
192 4,348,857

CLASS 57

18 4,348,858
100 4,348,860
401 4,348,859

CLASS 59

82 4,348,861

CLASS 60

314 4,348,862
327 4,348,863
454 4,348,864
493 4,348,865
561 4,348,866

CLASS 62

64 4,348,867
101 4,348,868
140 4,348,869
4,348,870
239 4,348,871
459 4,348,872
514 R 4,348,873

CLASS 65

2 4,349,364
10.1 4,349,365
27 4,349,366
4,349,367
28 4,349,368
60.4 4,349,369
4,349,370
4,349,371
4,349,372
60.8 4,349,373
107 4,349,374
291 4,349,375
345 4,349,376

CLASS 66

84 A 4,348,876

CLASS 68

13 R 4,348,877

CLASS 70

5 4,348,878
93 4,348,879
175 Re.31,027
456 R 4,348,880
4,348,881

CLASS 71

98 4,349,377
120 4,349,379

CLASS 72

202 4,348,882
446 4,348,883
479 4,348,884

CLASS 73

1 B 4,348,885
19 4,348,886
23 4,348,887
4,348,888
37.7 4,348,889
61.4 4,348,890
81 4,348,891
116 4,348,892
4,348,893
119 A 4,348,894
4,348,895
146.5 4,348,896
155 4,348,897
431 4,348,899
505 4,348,900
594 4,348,901
626 4,348,902
643 4,348,903
644 4,348,904
654 4,348,905
861.77 4,348,906
862.39 4,348,907
862.54 4,348,908
863.21 4,348,909
863.51 4,348,910

CLASS 74

10.33 4,348,911
61 4,348,912
339 4,348,913
467 4,348,914
473 R 4,348,915
489 4,348,916
568 R 4,348,917
805 4,348,918

CLASS 75

0.5 A 4,349,380
10 R 4,349,381
60 4,349,382
73 4,349,383
208 R 4,349,384

CLASS 76

112 4,348,919

CLASS 81

57.25 4,348,920
91 C 4,348,921
180 R 4,348,922

CLASS 83

23 4,348,923
39 4,348,924
435.1 4,348,925
833 4,348,926
4,348,927

CLASS 84

1.01 4,348,928
4,348,929
1.15 4,348,930
1.19 4,348,932
1.24 4,348,931
193 4,348,933
306 4,348,934
380 R 4,348,935

CLASS 89

1.5 D 4,348,936
24 4,348,937
33 BA 4,348,938
41 ME 4,348,939
140 4,348,940
155 4,348,941

CLASS 91

54 4,348,942
355 4,348,943
369 A 4,348,944
452 4,348,945
489 4,348,946

CLASS 98

58 4,348,947

CLASS 99

339 4,348,948
426 4,348,949
510 4,348,950

CLASS 100

127 4,348,951
158 R 4,348,952

CLASS 101

128.21 4,348,953
465 4,348,954

CLASS 102

317 4,348,955
377 4,348,956
378 4,348,957
499 4,348,958

CLASS 104

15 4,348,959
114 4,348,960
252 4,348,961

CLASS 105

42 D 4,348,964
248 4,348,962
363 4,348,963

CLASS 106

37 4,349,385
85 4,349,386
100 4,349,387
281 N 4,349,388
308 Q 4,349,389

CLASS 108

152 4,348,965

CLASS 109

2 4,348,966
51 4,348,967

CLASS 110

344 4,348,968

CLASS 112

184 4,348,969
256 4,348,970

CLASS 114

61 4,348,971
4,348,972
144 C 4,348,973
218 4,348,974
254 4,348,975
270 4,348,976
273 4,348,977
345 4,348,779

CLASS 116

28 R 4,348,978

CLASS 118

688 4,348,979
717 4,348,980
730 4,348,981

CLASS 119

1 4,348,982
4 4,348,983
14.08 4,348,984
15 4,348,985
20 4,348,986
4,348,987
53 4,348,988
72 4,348,989

CLASS 123

41.12 4,348,990
41.29 4,348,991
142.5 R 4,348,992
146.5 A 4,348,993
198 F 4,348,994
366 4,348,995
440 4,348,996
445 4,348,997
447 4,348,998
452 4,348,999
491 4,349,000
557 4,349,001
4,349,002
568 4,349,003
569 4,349,004
571 4,349,005
4,349,006
617 4,349,007
620 4,349,008

CLASS 126

121 4,349,009
271.1 4,349,010
419 4,349,011
422 4,349,012
442 4,349,013

CLASS 128

6 4,349,014
28 4,349,015
87 R 4,349,016
92 A 4,349,017
92 E 4,349,018
132 D 4,349,019
155 4,349,020
214 R 4,349,021
4,349,022
214.4 4,349,023
247 4,349,024
260 4,349,025
294 4,349,026
303 R 4,349,027
305 4,349,028
349 B 4,349,029
419 PG 4,349,030
642 4,349,031
660 4,349,032
4,349,033
681 4,349,034
766 4,349,035

CLASS 131

240 R 4,349,036
306 4,349,037

CLASS 132

40 4,349,038

CLASS 134

167 C 4,349,039

CLASS 135

5 R 4,349,040

CLASS 136

261 4,349,691

CLASS 137

1 4,349,041
39 4,349,042
505.42 4,349,043
512.3 4,349,044
625.5 4,349,045
899 4,349,046

CLASS 138

93 4,349,047
96 T 4,349,048
103 4,349,049
147 4,349,050
149 4,349,051

CLASS 139

92 4,349,052

CLASS 141

1 4,349,053
4,349,054
39 4,349,055
381 4,349,056

CLASS 144

230 4,349,057

CLASS 145

24 4,349,058
33 A 4,349,059

CLASS 148

6.15 R 4,349,390
4,349,391
6.2 4,349,392
142 4,349,393
175 4,349,394
187 4,349,395

CLASS 149

19.3 4,349,396

CLASS 152

172 4,349,060
209 R 4,349,061
356 R 4,349,062
359 4,349,063
418 4,349,064

CLASS 156

64 4,349,397
71 4,349,398
86 4,349,399
217 4,349,400
221 4,349,401
233 4,349,402
272.6 4,349,403
308.4 4,349,404
358 4,349,405
416 4,349,406
624 4,349,407
628 4,349,408
643 4,349,409
654 4,349,410
659.1 4,349,411

CLASS 159

47 WL 4,349,412

CLASS 162

23 4,349,413
123 4,349,414

CLASS 164

368 4,349,065
453 4,349,066
479 4,349,067

CLASS 165

1 4,349,068
4 4,349,069
173 4,349,070

CLASS 166

124 4,349,071
250 4,349,072
312 4,349,073

CLASS 173

48 4,349,074
134 4,349,075

CLASS 174

52 H 4,349,692
52 PE 4,349,693
128 R 4,349,694

CLASS 177

164 4,349,076

CLASS 178

22.08 4,349,695

CLASS 179

1 D 4,349,697
1 G 4,349,698
1 GS 4,349,696
1 SD 4,349,700
1 SM 4,349,699
2 TV 4,349,701
18 GE 4,349,702
18 HB 4,349,703
84 VF 4,349,704
90 L 4,349,705
100 C 4,349,706
107 R Re.31,031
175.31 R 4,349,707

CLASS 180

41 4,349,077
69.1 4,349,078
143 4,349,079
301 4,349,080

CLASS 181

130 4,349,081
4,349,082
135 4,349,083
146 4,349,084

CLASS 184

6.15 4,349,085

CLASS 186

49 4,349,086

CLASS 187

29 R 4,349,087

CLASS 192

3.3 4,349,088
4 A 4,349,089
53 F 4,349,091
53 G 4,349,090
67 R 4,349,092
107 R 4,349,093
109 F 4,349,094

CLASS 194

100 A 4,349,095

CLASS 198

347 4,349,096
369 4,349,097
497 4,349,098
751 4,349,099
783 4,349,100
851 4,349,101

CLASS 200

6 A 4,349,708
19 R 4,349,709
61.43 4,349,710
153 LA 4,349,711
159 B 4,349,712

CLASS 203

14 4,349,415
19 4,349,416
33 4,349,417
45 4,349,418
70 4,349,419
75 4,349,420

CLASS 204

38 B 4,349,421
98 4,349,422
146 4,349,423
192 E 4,349,424
192 P 4,349,425
195 M 4,349,426
243 R 4,349,427
294 4,349,428
299 R 4,349,429
302 4,349,430
4,349,431

CLASS 206

45.34 4,349,102
188 4,349,103
205 4,349,104
317 4,349,105
347 4,349,106
449 4,349,107
506 4,349,108
562 4,349,109
606 4,349,110

CLASS 208

130 4,349,432
139 4,349,433

CLASS 209

534 4,349,111
538 4,349,112

CLASS 210

94 4,349,434
96.1 4,349,435
104 4,349,436
169 4,349,437
180 4,349,438
242.3 4,349,439
321.1 4,349,440
321.2 Re.31,029
512.1 4,349,441
675 4,349,442

CLASS 211

103 4,349,113
151 4,349,114

CLASS 212

178 4,349,115

CLASS 215

330 4,349,116

CLASS 219

10.55 A 4,349,713
4,349,714
10.55 B 4,349,715
69 E 4,349,716
73.2 4,349,717
78.01 4,349,718
121 LK 4,349,719
130.33 4,349,720
145.23 4,349,721
202 4,349,722
271 4,349,723
347 4,349,724
373 4,349,725
511 4,349,726
544 4,349,727

CLASS 220

4 F 4,349,117
201 4,349,118
306 4,349,119
337 4,349,120
341 4,349,121
373 4,349,122
407 4,349,123
453 4,349,124

CLASS 221

96 4,349,125
112 4,349,126
196 4,349,127

CLASS 222

41 4,349,129
129.2 4,349,130
135 4,349,131
156 4,349,132
166 4,349,128
183 4,349,133
212 4,349,134
394 4,349,135
396 4,349,136

CLASS 223

73 4,349,137

CLASS 224

30 R 4,349,138
257 4,349,139

CLASS 225

97 4,349,140

CLASS 227

10 4,349,141
13 4,349,142
131 4,349,143

CLASS 228

2 4,349,144
208 4,349,145

CLASS 229

2.5 R 4,349,146
34 R 4,349,147

CLASS 235

400 4,349,728
4,349,729
472 4,349,730
489 4,349,731

CLASS 236

11 4,349,148
12 R 4,349,149

CLASS 238

265 4,349,150
349 4,349,151

CLASS 239

96 4,349,152
105 4,349,153
124 4,349,154
265.33 4,349,155
432 4,349,156
509 4,349,157

CLASS 241

14 Re.31,028
21 4,349,158
236 4,349,159

CLASS 242

18 R 4,349,160
47.01 4,349,161
54 R 4,349,162
68.3 4,349,163
107.4 A 4,349,164
118.11 4,349,165
197 4,349,166

CLASS 244

122 R 4,349,167
137 R 4,349,168
219 4,349,169

CLASS 246

63 4,349,170

CLASS 248

243 4,349,171
318 4,349,172
346 4,349,173

CLASS 249

58 4,349,174

CLASS 250

201 4,349,732
203 R 4,349,733
222 R 4,349,734
259 4,349,737
568 4,349,741
4,349,742
578 4,349,743

CLASS 251

31 4,349,175
129 4,349,176
230 4,349,177

CLASS 252

8.5 A 4,349,443
16 4,349,444
46.6 4,349,445
70 4,349,446
117 4,349,447
135 4,349,448
174.11 4,349,449
190 4,349,451
299.61 4,349,452
312 4,349,454
4,349,455
317 4,349,456
389 R 4,349,457
391 4,349,458
400 R 4,349,459
431 N 4,349,460
455 R 4,349,462
455 Z 4,349,461
457 4,349,463
463 4,349,464
466 PT 4,349,450
626 4,349,465
627 4,349,453

CLASS 254

216 4,349,178
270 4,349,179
277 4,349,180

CLASS 256

35 4,349,181

CLASS 260

112.5 R 4,349,466
117 4,349,470
208 4,349,471
229 4,349,735
239 BB 4,349,472
239.3 A 4,349,473
239.55 C 4,349,474
244.4 4,349,475
4,349,476
4,349,477
316 4,349,478
326 N 4,349,479
326.2 4,349,480
448 A 4,349,483
453 P 4,349,484
463 4,349,485
4,349,486
465 D 4,349,488
465 F 4,349,487

CLASS 261

41 D 4,349,489

CLASS 264

1.5 4,349,497
25 4,349,490
35 4,349,491
4,349,492
37 4,349,493
45.3 4,349,494
45.8 4,349,495
61 4,349,496
81 4,349,498
107 4,349,499
159 4,349,500
210.3 4,349,501
320 4,349,502
328.16 4,349,503
328.17 4,349,504

CLASS 266

57 4,349,182

CLASS 267

153 4,349,184
160 4,349,183

CLASS 270

32 4,349,185

CLASS 271

18 4,349,186
159 4,349,187
225 4,349,188
251 4,349,189
297 4,349,190

CLASS 272

118 4,349,191
4,349,192
4,349,193
4,349,194
134 4,349,195

CLASS 273

1 GC 4,349,196
1 GF 4,349,197
73 D 4,349,198
75 4,349,199
371 4,349,200
400 4,349,201
422 4,349,202

CLASS 277

26 4,349,203
34 4,349,204
188 A 4,349,205
207 R 4,349,206

CLASS 279

4 4,349,207

CLASS 280

12 K 4,349,208
16 4,349,209
47.21 4,349,210
481 4,349,211
610 4,349,212
638 4,349,213
752 4,349,214
804 4,349,215
807 4,349,216
808 4,349,217

CLASS 282

27.5 4,349,218

CLASS 285

21 4,349,219
121 4,349,220
149 4,349,221
363 4,349,222

CLASS 290

40 C 4,349,744

CLASS 292

259 R 4,349,223

CLASS 294

1 BA 4,349,224
16 4,349,225

CLASS 297

475 4,349,226

CLASS 299

2 4,349,227
10 4,349,228
32 4,349,229
33 4,349,230
69 4,349,231
92 4,349,232

CLASS 303

96 4,349,233

CLASS 305

56 4,349,234

CLASS 307

12 4,349,745
106 4,349,746
117 4,349,747
132 E 4,349,748
221 D 4,349,749
243 4,349,750
252 A 4,349,751
254 4,349,752
272 A 4,349,753
443 4,349,754
492 4,349,755
514 4,349,756

CLASS 310

15 4,349,757
68 A 4,349,758
233 4,349,759
248 4,349,760
266 4,349,761
332 4,349,762
370 4,349,763

CLASS 313

176 4,349,764
220 4,349,765
346 R 4,349,766
449 4,349,767

CLASS 315

105 4,349,768

CLASS 318

677 4,349,769
685 4,349,770
4,349,771
799 4,349,772

CLASS 320

5 4,349,773
25 4,349,774
35 4,349,775

CLASS 323

222 4,349,776
226 4,349,777
314 4,349,778
318 4,349,779

CLASS 324

262 4,349,780
346 4,349,781
390 4,349,782
457 4,349,783

CLASS 328

138 4,349,784

CLASS 329

50 4,349,785

CLASS 330

253 4,349,786
284 4,349,787
293 4,349,788

CLASS 331

4 4,349,789

CLASS 333

24.1 4,349,790
27 4,349,791
81 A 4,349,792
111 4,349,793
141 4,349,794
176 4,349,795
186 4,349,796
215 4,349,797
230 4,349,798
246 4,349,799

CLASS 335

207 4,349,800

CLASS 336

84 C 4,349,801

CLASS 337

159 4,349,802
186 4,349,803
198 4,349,804
255 4,349,805
343 4,349,806
360 4,349,807

CLASS 338

18 4,349,808

CLASS 339

14 T 4,349,235
44 M 4,349,236
65 4,349,237
75 M 4,349,238
97 R 4,349,239
103 R 4,349,240
143 R 4,349,241

CLASS 340

52 H 4,349,809
79 4,349,810
347 DA 4,349,811
522 4,349,812
638 4,349,813
679 4,349,814
705 4,349,815
781 4,349,816
784 4,349,817
785 4,349,818
812 4,349,819
825.71 4,349,820
870.21 4,349,821
870.34 4,349,822

CLASS 343

7 VM 4,349,823
700 MS 4,349,824
750 4,349,825
773 4,349,826
786 4,349,827

CLASS 346

1.1 4,349,828
140 R 4,349,829
4,349,830

CLASS 350

81 4,349,242
96.23 4,349,243
255 4,349,244
264 4,349,245
298 4,349,246
302 4,349,247
413 4,349,248
483 4,349,249

CLASS 351

32 4,349,250
128 4,349,251

CLASS 352

58 4,349,252

CLASS 353

112 4,349,253

CLASS 354

25 4,349,254
31 4,349,255
43 4,349,256
126 4,349,257
127 4,349,258
135 4,349,259
145 4,349,260
152 4,349,261
173 4,349,262
234 4,349,263
4,349,264
286 4,349,265
295 4,349,266
323 4,349,267

CLASS 355

4 4,349,268
14 SH 4,349,269
15 4,349,270
60 4,349,271
69 4,349,272
72 4,349,273

CLASS 356

1 4,349,274
36 4,349,275
73.1 4,349,276
376 4,349,277
394 4,349,278
402 4,349,279

CLASS 357

74 4,349,831

CLASS 358

8 4,349,832
23 4,349,833
27 4,349,834
76 4,349,835
93 4,349,836
4,349,837
125 4,349,838
148 4,349,839
188 4,349,840
194.1 4,349,841
197 4,349,842
206 4,349,843
244 4,349,844
254 4,349,845
280 4,349,846
293 4,349,847

CLASS 360

66 4,349,848
71 4,349,849
74.2 4,349,850
105 4,349,851
137 4,349,852

CLASS 361

19 4,349,853
21 4,349,854
127 4,349,855
160 4,349,856
173 4,349,857
181 4,349,858
218 4,349,859
310 4,349,860
347 4,349,861
401 4,349,862

CLASS 362

20 4,349,863
122 4,349,864
250 4,349,865
263 4,349,866

CLASS 363

160 4,349,867

CLASS 364

157 4,349,868
159 4,349,869
200 4,349,870
4,349,871
4,349,872

CLASSIFICATION OF PATENTS

4,349,873
4,349,874
4,349,875
426 4,349,876
431.05 4,349,877
484 4,349,878
492 4,349,879
507 4,349,880
509 4,349,881
4,349,882
551 4,349,883
557 4,349,884
558 4,349,885
573 4,349,886
703 4,349,887
716 4,349,888
724 4,349,889
900 4,349,890
4,349,891

CLASS 365

8 4,349,892
20 4,349,893
154 4,349,894
230 4,349,895

CLASS 366

183 4,349,280

CLASS 367

26 4,349,896
98 4,349,897
138 4,349,898

CLASS 368

75 4,349,899
187 4,349,900

CLASS 369

45 4,349,901
132 4,349,902

CLASS 370

57 4,349,903

CLASS 371

69 4,349,904

CLASS 372

46 4,349,905
50 4,349,906
92 4,349,907
103 4,349,908

CLASS 373

84 4,349,909
91 4,349,910
105 4,349,911
4,349,912

CLASS 374

124 4,348,898
136 4,349,281
183 4,349,282

CLASS 375

25 4,349,913
40 4,349,914
4,349,915
103 4,349,916

CLASS 376

130 4,349,505
142 4,349,506
230 4,349,507

CLASS 378

24 4,349,917
25 4,349,740
49 4,349,738
83 4,349,736
99 4,349,739

CLASS 400

124 4,349,283
320 4,349,284
4,349,285
492 4,349,286
569 4,349,287

CLASS 401

7 4,349,288

CLASS 402

30 4,349,289
55 4,349,290

CLASS 403

15 4,349,291
322 4,349,292

CLASS 404

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